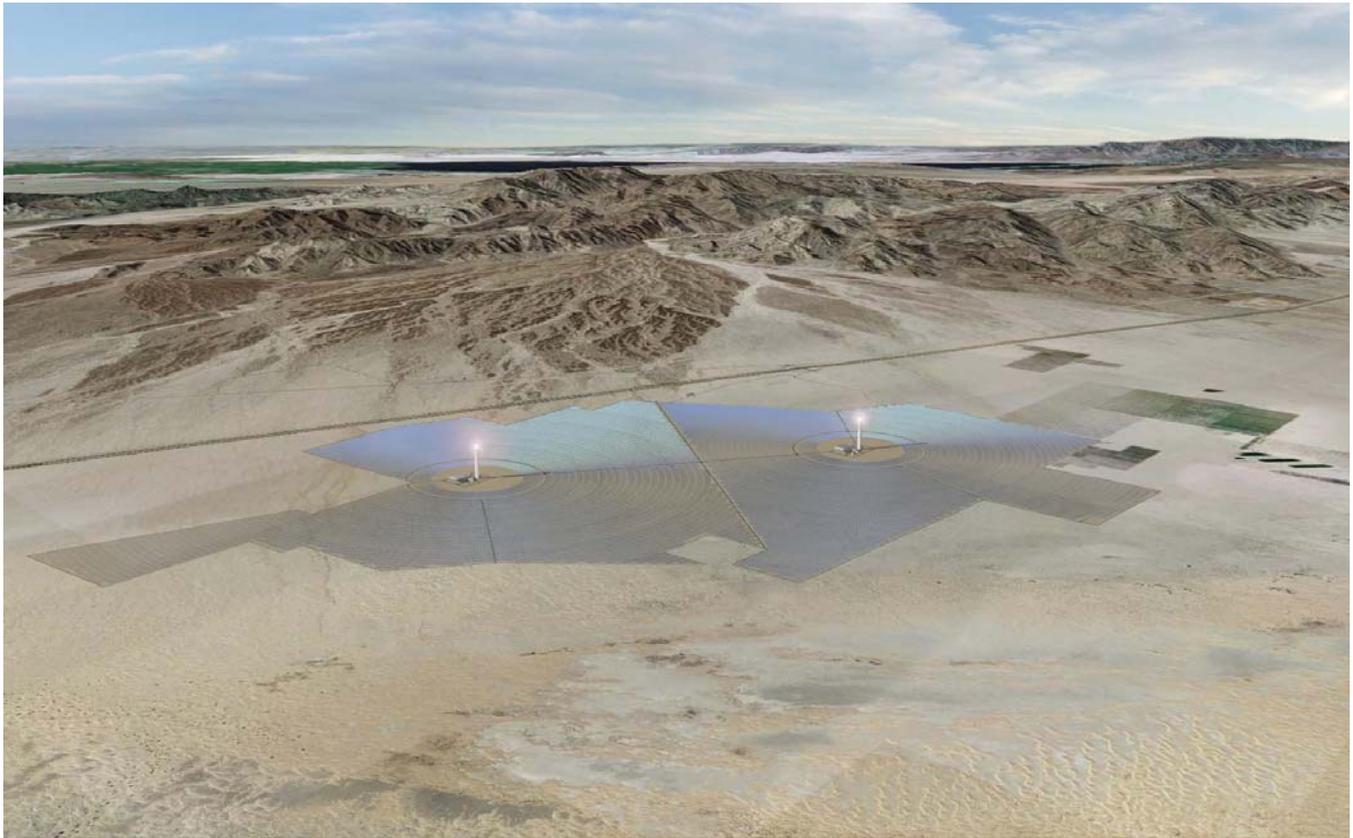


## DOCKETED

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# PALEN SOLAR ELECTRIC GENERATING SYSTEM

## Revised Presiding Member's Proposed Decision



CALIFORNIA  
ENERGY COMMISSION  
Edmund G. Brown Jr., Governor

September 2014  
CEC-800-2014-002-PMPD-REV

DOCKET NUMBER 09-AFC-07C

**CALIFORNIA  
ENERGY COMMISSION**

1516 Ninth Street  
Sacramento, CA 95814

<http://www.energy.ca.gov/sitingcases/palen/index.html>

***COMMISSIONERS-***

KAREN DOUGLAS  
*Commissioner, Presiding Member*

DAVID HOCHSCHILD  
*Commissioner, Associate Member*

KEN CELLI  
*Hearing Adviser*

**DISCLAIMER**

This report was prepared by the California Energy Commission Palen Solar Electric Generating System Amendment Committee as part of Palen Solar Electric Generating System Amendment Docket No. 09 AFC-07C. The views and recommendations contained in this document are not official policy of the Energy Commission until the report is adopted at an Energy Commission Business Meeting.



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT  
COMMISSION OF THE STATE OF CALIFORNIA  
1516 NINTH STREET, SACRAMENTO, CA 95814  
1-800-822-6228 – WWW.ENERGY.CA.GOV

The Committee hereby submits its Revised Presiding Member's Proposed Decision for the Palen Solar Electric Generating System Amendment (Docket Number 09-AFC-07C). We have prepared this document pursuant to the requirements set forth in the Commission's regulations. (Cal. Code Regs., tit. 20, §§ 1749-1752.5.)

The Committee recommends that the Revised Presiding Member's Proposed Decision be approved, subject to the Conditions of Certification set forth herein, and that the Energy Commission grant the project owner a license to construct and operate the Amended Palen Solar Electric Generating System Project.

Dated September 12, 2014, at Sacramento, California.

***Original Signed By:***

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KAREN DOUGLAS  
Commissioner and Presiding Member  
Palen Solar Electric Generating System  
Amendment Committee

***Original Signed By:***

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DAVID HOCHSCHILD  
Commissioner and Associate Member  
Palen Solar Electric Generating System  
Amendment Committee

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## INTRODUCTION

### A. SUMMARY OF THE PROPOSED DECISION

The Decision contains the Commission's determinations regarding the Petition for Amendment of the December 15, 2010 Commission Decision approving the Application for Certification (AFC) for the Palen Solar Power Plant (PSPP), now known as the Palen Solar Electric Generating System (PSEGS). This Decision includes the findings and conclusions required by law and is based exclusively upon the record established during this certification proceeding and summarized in this document.<sup>1</sup> We have independently evaluated the evidence, provided references to the record<sup>2</sup> supporting our findings and conclusions, and specified the measures required to ensure that the project is designed, constructed, and operated in the manner necessary to protect public health and safety, promote the general welfare, and preserve environmental quality.

In this Decision, we have found that PSEGS project as described in the Petition to Amend will cause significant unmitigated impacts to biological, cultural, and visual resources. As described in more detail in the **ALTERNATIVES** section of this Decision, the Reduced Acreage Alternative with a single power tower is a superior alternative to the proposed PSEGS project because it feasibly lessens most of the PSEGS significant impacts while attaining most of the project's objectives. However, we also find that the Reduced Acreage Alternative with a single power tower will still cause significant unmitigated (albeit reduced) impacts to biological, cultural, and visual resources. As explained in more detail in the **OVERRIDE FINDINGS** section of this Decision, we find that the benefits of the Reduced Acreage Alternative outweigh those impacts and **APPROVE** the Reduced Acreage Alternative with a single power tower.

The Petition was filed by Palen Solar Holdings, LLC (Petitioner, hereinafter "PSH"), a successor in interest to Solar Trust of America formerly known as Solar Millennium, Inc., the original licensee.<sup>3</sup>

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<sup>1</sup> The requirements for an amendment of an Energy Commission Decision are set forth in the Commission's regulations, title 20, California Code of Regulations, section 1769. They are summarized in subsection B, below.

<sup>2</sup> The Reporter's Transcripts of the evidentiary hearings are cited as "date of hearing RT page   :line  ." For example: 10/1/14 RT 77:3. The exhibits included in the evidentiary record are cited as "Ex. number." A list of all exhibits is contained in **Appendix B** of this Decision. For documents such as motions, notices and orders which have been docketed but were not received into evidence, we cite to the docket transaction number, such as (TN 1234567).

<sup>3</sup> On April 2, 2012, Solar Millennium petitioned for relief in federal bankruptcy court. On June 21, 2012, the bankruptcy court approved the transfer of the project to BrightSource. The Commission subsequently approved a petition to amend the Final Decision to transfer ownership of the Project to Palen SEGS I, LLC, a wholly owned indirect subsidiary of BrightSource (Order No. 12-0711-3). After approval of the ownership transfer of the Final Decision to Palen SEGS I, LLC, BrightSource formed a joint venture to

On August 24, 2009, Palen Solar I, LLC (PSI) filed an AFC with the Commission to construct and operate a nominal 500 megawatt (MW) concentrating solar thermal electric power generating facility using solar parabolic trough technology. The Commission issued a Final Decision approving two alternative configurations for the original project, then known as PSPP, on December 15, 2010 (Order No. 10-1215-19, the “Final Decision,” 09-AFC-7). Approved Reconfigured **Alternative 3** concentrated development of project facilities on federal land managed by the United States Bureau of Land Management (BLM), while Approved Reconfigured **Alternative 2** allowed development of project facilities on federal land and on adjacent private parcels should PSI acquire the private parcels in the future.

The changes to the original project proposed by the amendment are described in detail in the **PROJECT DESCRIPTION** section of this Decision.

During the original decision process, and again in the proposed PSEGS amendment review process, Energy Commission staff (Staff) and the Petitioner carried out extensive coordination with numerous local, state, and federal agencies. These included the U.S. Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), and other regulatory agencies with an interest in this project. Through these efforts, Applicant, Staff, and these various agencies had reached mutual agreement on almost all aspects of the amended project and upon the necessary conditions of certification. Energy Commission Staff also had numerous meetings and informal consultations with local Native American tribal leaders and their community members regarding the proposed amendment.

At the time of the 2013 evidentiary hearings on the PSEGS amendment, four disputes remained between the Petitioner and Staff. In the area of Traffic and Transportation, Staff, on behalf of CalTrans, recommended a change to Condition of Certification **TRANS-1** that would require a minimum level of service of LOS C or better at intersections necessary to enter and exit the PSEGS site. However, at the evidentiary hearing, a CalTrans representative stated that the disputed language was not required

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develop the site using BrightSource’s solar power tower technology. The joint venture company is PSH.<sup>3</sup> On April 2, 2012, Solar Millennium petitioned for relief in federal bankruptcy court. On June 21, 2012, the bankruptcy court approved the transfer of the project to BrightSource. The Commission subsequently approved a petition to amend the Final Decision to transfer ownership of the Project to Palen SEGS I, LLC, a wholly owned indirect subsidiary of BrightSource (Order No. 12-0711-3). After approval of the ownership transfer of the Final Decision to Palen SEGS I, LLC, BrightSource formed a joint venture to develop the site using BrightSource’s solar power tower technology. The joint venture company is PSH. PSH is the parent company of Palen SEGS I, LLC and Palen SEGS II, LLC. Under the Petitioner’s proposed PSEGS Amendment, Palen SEGS I, LLC would own and operate Unit 1, Palen SEGS II, LLC would own and operate Unit 2, and both entities would share ownership of common facilities and the generation tie-line. Since both entities are wholly owned by PSH, this Decision will refer to the Applicant as PSH.

and Staff agreed to remove it from the condition. (10/28/13 RT 174:22 – 180:12.) As is discussed in the **BIOLOGICAL RESOURCES, CULTURAL RESOURCES, GEOLOGY AND PALEONTOLOGY**, and **WORKER SAFETY AND FIRE PROTECTION** sections below, Staff and Petitioner did not come to agreement on the language of certain conditions. After the 2014 evidentiary hearings, Staff and Petitioner agreed on the language of conditions in the **BIOLOGICAL RESOURCES** section, but differences in the language of **CULTURAL RESOURCES** Condition of Certification **CUL-1** remained.

The remaining sections of this Decision describe the changes to the originally approved PSCP project, the environmental effects of Petitioner's proposed PSEGS amended project with two solar power towers, and conformance of the amended project with applicable laws, ordinances, regulations, and standards (LORS), project benefits, public comment and conditions of certification. We have left intact the analyses of both phases of the PSEGS project because we feel it is beneficial to the public and potential future applicants to be apprised of the environmental impacts and mitigation analysis of both phases of the whole of the project, even though we are only certifying the first phase, which is the Reduced Acreage Alternative with a single solar power tower.

## **B. AMENDMENT PROCESS**

PSEGS and its related facilities fall within Energy Commission licensing jurisdiction. (Pub. Resources Code, §§ 25500 et seq.) During its licensing proceedings, the Commission acts as lead state agency under the California Environmental Quality Act (CEQA) (Pub. Resources Code, §§ 25519(c), 21000 et seq.), and the Commission's siting process and associated documents are functionally equivalent to the preparation of the traditional Environmental Impact Report. (Pub. Resources Code, § 21080.5.) A license issued by the Commission is in lieu of other state and local permits.

The Commission's certification process provides a thorough and timely review and analysis of all aspects of this proposed project. During the process, the Commission conducts a comprehensive examination of a project's potential economic, public health and safety, reliability, engineering, and environmental ramifications.

Significantly, the Commission's process allows for and encourages public participation so that members of the public may become involved either informally, or on a more formal level, as an Intervenor with the same legal rights and duties as other parties to the proceedings. Public participation is encouraged at every stage of the process.

After a license is approved, it may be amended on the petition of the Applicant. (California Code of Regulations, tit. 20, section 1769.) Depending on the complexity and expected level of public interest, an amendment may be analyzed by Staff and referred directly to the Energy Commission for decision. Alternatively, as was the case in this proceeding, the amendment may be referred to a committee of two commissioners who take evidence and submit a proposed decision to the Energy Commission. In either

event, the Commission must make the following findings before approving an amendment:

- That the amended project will not have significant,<sup>4</sup> unmitigated, environmental effects, or that specific economic, social, or other considerations make infeasible the mitigation measures or project alternatives identified in the proceeding, and that the benefits of the project outweigh the unavoidable significant environmental effects of the project;
- That the amended project will remain in compliance with all applicable LORS, or that the facility is required for the public convenience and necessity, and that there are not more prudent and feasible means of achieving the public convenience and necessity;
- That the change in the project will be beneficial to the public, Applicant, or Intervenors; and
- That there has been a substantial change in circumstances since the original approval justifying the change, or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval.<sup>5</sup>

### **C. BASELINE FOR AN AMENDMENT**

CEQA requires an Environmental Impact Report (EIR) to include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced.” (CEQA Guidelines, Cal. Code Regs., tit. 14, § 15125.) This environmental setting normally constitutes the baseline physical conditions by which a lead agency determines whether an impact is significant.

In considering the environmental effects of a modification of a project for which the CEQA process has already been completed, a lead agency is authorized to limit its analysis to the incremental effects of the proposed changes. (Pub. Resources Code § 21166; CEQA Guidelines, Cal. Code Regs., tit. 14, § 15162.) The underlying rationale is that in-depth review has already occurred and the time for challenging the sufficiency of the original EIR has expired; accordingly, the question for the lead agency is whether circumstances have changed enough to justify repeating a substantial portion of the process. (*Benton v. Board of Supervisors* (1991) 226 Cal.App.3d 1467, 1475-1480.)

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<sup>4</sup> The Commission’s regulations use the term “significant adverse environmental effect.” See, e.g., Cal. Code of Regs., tit. 20, §1755. “Adverse” is redundant, however, in that by definition in the CEQA Guidelines (Cal. Code Regs., tit. 14, § 15382) an effect must be “adverse” in order to be “significant”; positive or beneficial effects cannot be significant. Therefore, when we use the terms “significant effect” or “significant impact” in this Decision, the reader may assume that those effects and impacts are adverse.

<sup>5</sup> Cal. Code Regs., tit. 20, subsections 1769(a)(3), 1755(d).

The Energy Commission meets its CEQA obligations through a site certification program that has been certified by the Secretary of the Resources Agency as conforming to the principles and applicable requirements of the California Environmental Quality Act. (Pub. Resources Code §§ 25519, subd. (c); 21166; CEQA Guidelines, Cal. Code Regs., tit. 14, § 15251 (j).) Under a certified regulatory program, a lead agency can use a plan or other written documentation instead to meet its CEQA obligations. (Pub. Resources Code § 21080.5.)

The Energy Commission used its certified regulatory program in evaluating the environmental impacts of the approved PSPP. Petitioner PSH filed its Petition under Commission Regulation 1769 (Cal. Code Regs., tit. 20, §1769) as a post-certification modification to the design and operation of the PSPP. The Committee has treated, and intends to continue treating, the Petition as an amendment. This action by the Committee is entitled to great weight. (See, e.g., *Benton v. Board of Supervisors* (1991) 226 Cal.App.3d 1467; *Temecula Band of Luiseno Mission Indians v. Rancho California Water District* (1996) 43 Cal.App.4th 425.)

Intervenor CRIT argues that a recent California Supreme Court case mandates a different baseline; that of the un-built environment. (CRIT 8/15/14 Opening Brief, p. 17.) However, CRIT's reliance on *Neighbors for Smart Rail v. Exposition Metro Line Const. Authority* (2013) 57 Cal.4<sup>th</sup> 439 is misplaced because that case involved a Lead Agency's discretion to use a *future* baseline, not a permitted baseline. Intervenor CBD raises a contingent challenge to use of the permitted baseline, citing *Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.3d 310. CBD accepts the use of the permitted baseline only if the Commission finds that the no-project alternative (which is the permitted project) is feasible. (CBD 8/15/14 Opening Brief, p. 22.) However, CBD argues that should the no-project be deemed infeasible, the existing environment must be used as the baseline because a comparison of the proposed project to an infeasible baseline would be illusory. CBD misapprehends the applicability of *Communities for a Better Environment*. That case involved a lead agency's decision to identify a permitted level of refinery emissions as the baseline, without reference to any previous environmental analysis of those emissions. Here, the impacts associated with the PSPP baseline were thoroughly evaluated. Moreover, mitigation measures identified in the PSPP Decision are applicable to PSEGS, *unless modified to reflect the changes between the permitted project and the proposed project*. This is not an illusory comparison. The record is clear that all project impacts, whether stemming from the original PSPP or from the amendment of the project, have been analyzed, disclosed, and to the extent feasible, mitigated. We find that a supplemental environmental assessment is necessary to address the PSEGS' incremental effects of the changes to the approved PSPP. The

PSPD Decision in addition to the PSEGS Decision together provide a complete analysis of the whole of the project.

#### **D. PROCEDURAL HISTORY**

On December 17, 2012, the Petitioner filed the Petition to Amend (Ex. 1003), the subject of this amendment proceeding and Decision. The matter was assigned by the Energy Commission to a Committee consisting of Commissioners Karen Douglas and David Hochschild. The Committee conducted a Public Informational Hearing and Site Visit on February 20, 2013, during which the Committee and public toured the project site, and the Petitioner and Staff described the proposed amendment and the process for considering the amendment application. Staff originally proposed, and the Committee issued, a schedule in which Staff would file its Preliminary Staff Assessment (PSA) on May 22, 2013, and its Final Staff Assessment (FSA) on July 23, 2013.

Delays in obtaining some of the information necessary to prepare the PSA resulted in the publication of the PSA on June 28, 2013, and publication of portions of the FSA on September 12, 2013 (Ex. 2000). The omitted **CULTURAL RESOURCES** section of the FSA was filed September 23, 2013 (Ex. 2001). The omitted **AIR QUALITY** section (including **GREENHOUSE GASES**) was published on November 1, 2013 (Ex. 2013).

The Intervenors in the PSEGS amendment proceedings were California Unions for Reliable Energy (CURE) (petition granted December 23, 2009), Californians for Renewable Energy (CaRE) (petition granted March 11, 2010), Basin and Range Watch (BRW) (petition granted April 19, 2010), Center for Biological Diversity (CBD) (petition granted July 2, 2010), Laborers' International Union of North America, Local Union No. 1184 (LiUNA) (petition granted March 26, 2013; petition withdrawn August 4, 2014), and Colorado River Indian Tribes (CRIT) (petition granted September 25, 2013).

On October 24, 2013, a Prehearing Conference was held, at which time the Committee determined that all issues were ready for hearing. An evidentiary hearing followed on October 28, and October 29, 2013, in Palm Desert, California, wherein we received evidence from the parties as well as public comment on all topics except Air Quality and Greenhouse Gases. On November 22, 2013, and November 25, 2013, the Committee reconvened an evidentiary hearing in Sacramento to receive evidence on Air Quality and Greenhouse Gases. On November 25, 2013, the evidentiary record was closed.

On December 13, 2013, the Committee issued its Presiding Member's Proposed Decision (PMPD) recommending a denial of the Petition to Amend (TN 201434) due to insufficient evidence about actual avian impacts from power tower solar flux. On December 23, 2014, Petitioner requested a delay in the schedule to obtain additional evidence to cure evidentiary deficiencies cited in the PMPD (TN 201464). The Committee granted the request and held a public hearing in Sacramento on January 7,

2014, to discuss the topics and procedures the Petitioner would need to address to supplement the record (TN 201466; TN 201546).

On March 21, 2014, Petitioner brought a Motion to Reopen the Evidentiary Record (TN 201900). The Committee granted the motion on May 21, 2014, and limited the evidence in the Notice of Prehearing Conference and Evidentiary Hearings to nine subject areas as follows: (a) solar flux impacts to avian species; (b) solar flux impacts to invertebrate species; (c) provisions for the curtailment of operations to avoid excessive mortality to flying fauna; (d) strategies to prevent flying fauna from entering the solar flux field; (e) glint and glare impacts to aviation; (f) economic feasibility of alternatives and the status of milestones contained in the Power Purchase Agreement (PPA); (g) overriding considerations; (h) natural gas consumption; and (i) Condition of Certification **CUL-1** (TN 202407).

The evidentiary hearings on the above nine subject areas took place in Blythe, California, on July 29, and 30, 2014. The Committee, having found that the Reduced Acreage Alternative with a single solar power tower was a feasible and superior alternative to the proposed PSEGS project, issued the Revised Presiding Member's Proposed Decision (RPMPD) on September 12, 2014 recommending certification of the Reduced Acreage Alternative with a single solar power tower. Public and party comments were accepted during a 30-day comment period ending on October 13, 2014, and at a public hearing, which was convened in Palm Desert by the Committee on October 6, 2014. An Errata and Revisions to the RPMPD were issued on

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## **E. COMMISSION OUTREACH**

Several entities within the Energy Commission provide various notices concerning power plant siting cases. Staff provides notices of Staff workshops and the release of the Staff Assessments. The Hearing Office notices Committee-led events such as the Informational Hearing and Site Visit, Status Conferences, the Prehearing Conference, and evidentiary hearings. The Public Adviser's Office provides additional outreach for critical events as well as provides information to interested persons that would like to become more actively involved in a power plant siting proceeding. Further, the Media Office provides notice of events to local and regional press through press releases. The public may also subscribe to the proceeding's e-mail List Server offered on the web page for each project, which gives an immediate notification of documents posted to the project web page. The Energy Commission website allows electronic filing of comments that are docketed and posted to the website. Through the activities of these entities, the Energy Commission has made every effort to ensure that interested persons are notified of activities in this proceeding.

## **F. PUBLIC COMMENT**

The record contains public comments from concerned individuals and organizations. Throughout these proceedings, as reflected in the transcribed record, the Committee provided an opportunity for public comment at each Committee-sponsored conference and hearing. Numerous oral and written public comments were received during the evidentiary hearings and, to a lesser extent, during the PMPD and RPMPD comment hearings and comment periods. A “Public Comments” subheading is included in each section of this Decision where the public comments that relate to that section are addressed and considered.

## **G NOTE REGARDING FORMAT OF THIS DECISION**

The remainder of this Decision is organized by topic in the same order as the 2010 Decision. The discussions focus on whether the amended project would cause any significant environmental impacts, appropriate mitigation for any such impacts, and whether the amended project would continue to comply with all applicable laws, ordinances, regulations, and standards (“LORS”). Where none of the circumstances described in the CEQA Guidelines require changes to the analysis, findings, or conclusions in the 2010 Decision, we will not repeat the Decision’s analysis beyond a brief explanation of our reasons for making that determination. (Cal. Code Regs., tit. 14, section 15162.) For the convenience of the parties and public we will, however, reprint all of the conditions of certification for the project, whether or not they are changed from those adopted in 2010. The conditions of certification have been modified to apply to the Reduced Acreage Alternative.

The December 22, 2010 Final Commission Decision for the PSPP can be viewed at:

<http://docketpublic.energy.ca.gov/PublicDocuments/Regulatory/Non%20Active%20AFC's/09-AFC-7%20Palen%20Solar/2010/December/TN%2059350%2012-22-10%20Commission%20Decsion.pdf>

The December 13, 2013 PMPD can be viewed at:

[http://docketpublic.energy.ca.gov/PublicDocuments/09-AFC-07C/TN201434\\_20131213T150623\\_Presiding\\_Member's\\_Proposed\\_Decision.pdf](http://docketpublic.energy.ca.gov/PublicDocuments/09-AFC-07C/TN201434_20131213T150623_Presiding_Member's_Proposed_Decision.pdf)

## I. PROJECT DESCRIPTION

### INTRODUCTION TO PROJECT DESCRIPTION

The Petition to Amend the Palen Solar Electricity Generating System (PSEGS) project originally described two 250-megawatt (MW) units using the solar power tower technology. The Petitioner described two phases of the project. The first phase would consist of the northwestern tower and the associated solar block and solar field, which would also include the common area, the switch yard, and all project linears including the project access road, gen-tie line, and the natural gas supply line. The second phase would consist of the second southeastern tower and its associated power block and solar field. (Ex. 1167; 7/30/14 RT 29:19 – 30:17.)

After the close of the evidentiary record, we have found that the Reduced Acreage Alternative using a single solar power tower was a feasible and superior alternative to the proposed PSEGS. Therefore, we amend the current certification to approve certification of the Reduced Acreage Alternative, which is similar to Petitioner's Phase I of the PSEGS Revised Phasing Plan. (Ex.1166.)

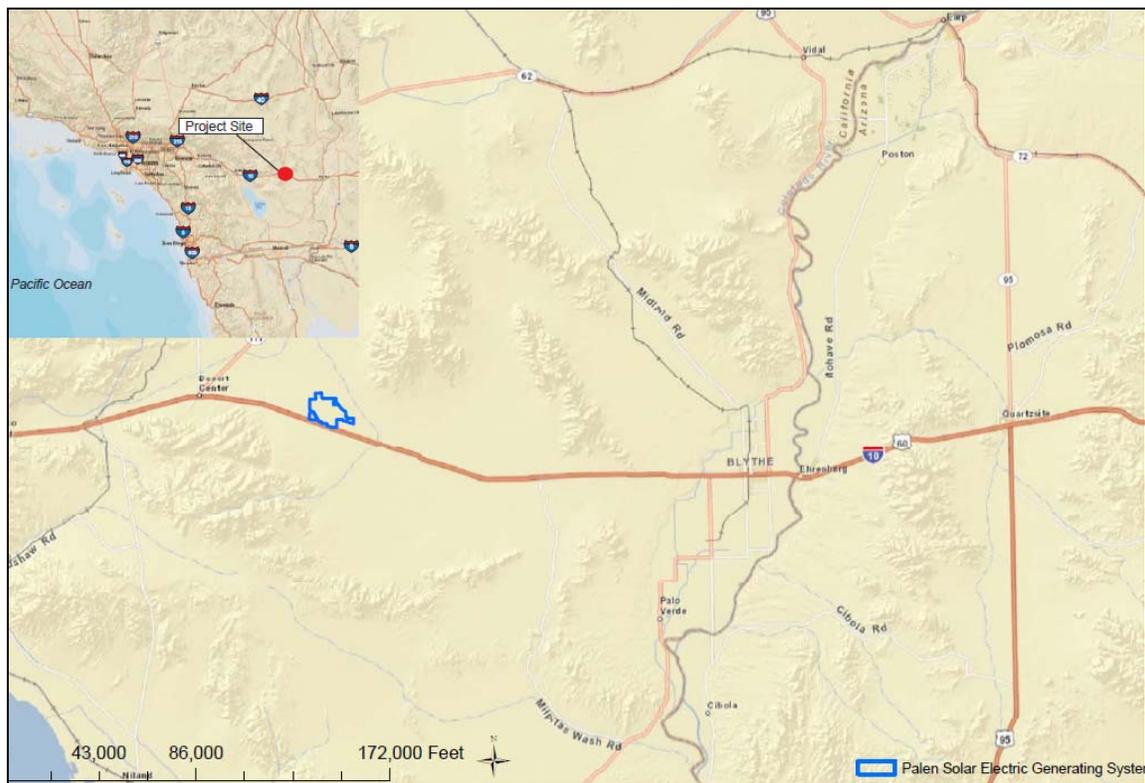
We believe it is foreseeable that the project owner or another applicant could apply for certification of a project similar to the proposed second phase of the PSEGS. At the evidentiary hearings, Petitioner offered a modification of Condition of Certification **BIO-29** which identifies all acres of disturbance for the two project phases, matches each acre up with mitigation ratios identified for certain land and other conditions of certification for biological resources, and prescribes compensatory mitigation requirements for each phase. (Ex. 1170.) Petitioner also offered a modified Condition of Certification **SOIL AND WATER-3**, which allocates the use of groundwater during construction and operation of the project. (Ex. 1169.) Staff concurred with Petitioner that no further environmental analyses were necessary and that the change to the Reduced Acreage Alternative with a single solar power tower project would either have a beneficial effect or no additional effect at all. (7/30/14 RT 29:19 – 34:20.)

In light of the foreseeable future Application for Certification on the second phase of PSEGS, we have decided to leave intact the analysis of both phases of the PSEGS project. We believe it is beneficial to the public and potential future applicants to be apprised of the environmental impacts and mitigation analysis of both phases of the PSEGS project, even though we are only certifying the Reduced Acreage Alternative.

## LOCATION

The proposed amended project PSEGS project would occupy the same location as the certified project (Palen Solar Power Plant [PSPP]), but would reduce the project footprint from approximately 4,366 acres to approximately 3,794 acres. The Reduced Acreage Alternative would further reduce the project footprint to approximately 1,960 acres. (Ex. 2000, p. 6.1-76.) PSEGS is located entirely on public land managed by the Bureau of Land Management (BLM) (Right-of-Way No. CACA-048810). The project site is located approximately ¼ mile north of Interstate 10 (I-10), approximately 10 miles east of Desert Center and approximately halfway between the Cities of Indio and Blythe, in Riverside County, California. (See **Project Description - Figure 1.**) (Exs. 1003, p. 2-2; 2000, p. 3-1.)

**Project Description - Figure 1  
PSEGS Site Vicinity Map**



(Ex. 2000, Project Description Figure 1.)

The following exhibits on project description were received into evidence on October 28, 2013: Exhibits 1003, 1008, 1023, 1028, 1039, 1076, 1077, 1078, 2000, 2001, 2003, and 2008. (10/28/13 RT 277:2 – 279:23.) The following exhibits on project description were received into evidence on July 30, 2014: Exhibits 11152, 1166 through 1169, 2000, 2017, 3113 through 3125, 3146 through 3149, and 3152. (7/30/14 RT 75:7 – 78:13.)

## THE CERTIFIED PROJECT - PALEN SOLAR POWER PROJECT (PSPP)

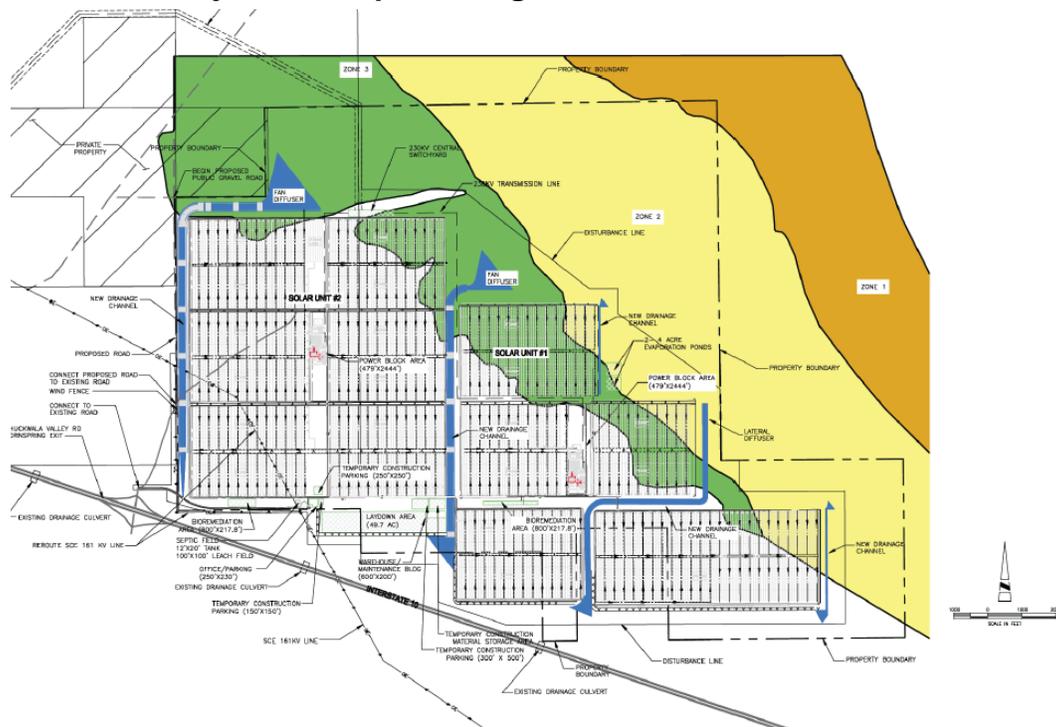
The 2010 Final Decision for the PSPP approved a solar thermal generating facility consisting of two separate units of 250-MW solar parabolic trough technology, with a total nominal capacity of 500 MW. With this technology, arrays of parabolic mirrors focus the sunlight on a receiver tube to create and collect heat energy. The receiver tube is located at the focal point of the trough's parabola. A heat transfer fluid (HTF) is heated to 750°F as it circulates through the receiver tubes. The HTF is then piped through a series of heat exchangers to generate high pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced. Individual components of the PSPP include:

- Graded Solar Field & Power Block #1 (east);
- Graded Solar Field & Power Block #2 (west);
- Access road from Corn Springs Road;
- Warehouse/maintenance building, assembly hall, and lay-down area;
- Telecommunications lines;
- Liquefied petroleum gas (LPG) tank;
- Concrete batch plant;
- Fuel depot;
- On-site transmission facilities, including central internal switchyard;
- Single-circuit, 230-kV transmission line interconnecting to Southern California Edison's (SCE) Red Bluff Substation;
- Groundwater wells used for water supply;
- Four evaporation ponds for wastewater;
- Septic systems for sanitary wastewater; and
- Land treatment plots for remediating spills of Therminol HTF.
- (Ex. 2000, pp. 3-1 – 3-2.)

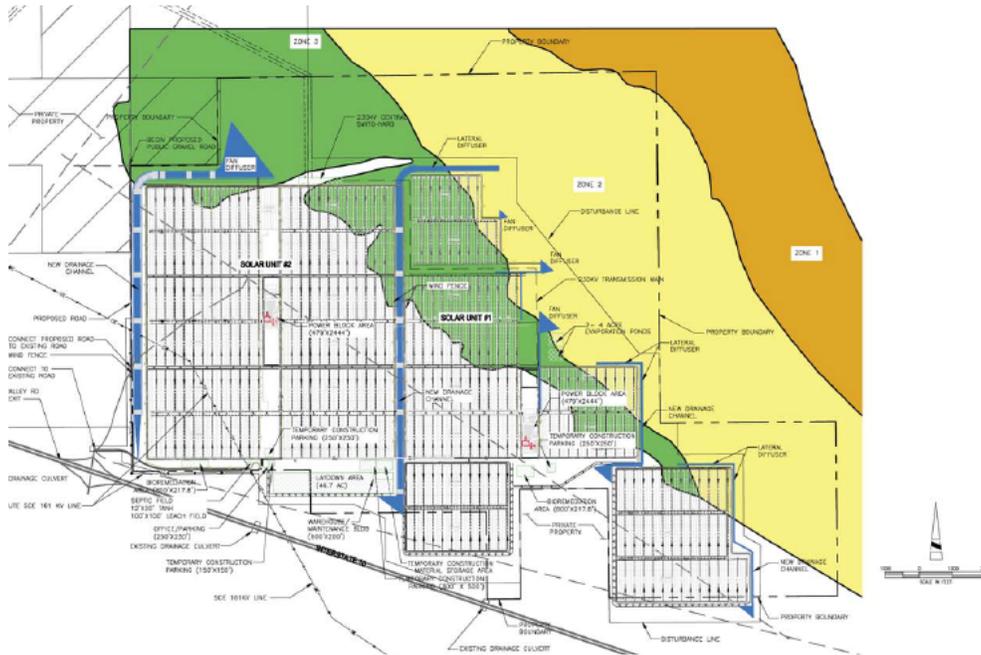
During the Energy Commission's licensing process, two alternative sites located slightly more to the west were offered to prevent the project footprint from interfering with the area with the greatest sand transport potential. **Alternative 2** incorporated into the project boundary 240 acres of private land near the southeast corner of the site, over which the PSPP owner did not have control. **Alternative 3** did not incorporate private

land. Because of the lack of ownership of the private land used in Reconfigured **Alternative 2**, the Energy Commission approved use of either Reconfigured **Alternative 2** or Reconfigured **Alternative 3**. (See **Project Description - Figures 2 and 3**.) (Ex. 2000, p. 3-2.)

**Project Description - Figure 2 – PSPP Alternative A**



## Project Description - Figure 3 – PSCP Alternative B



### THE AMENDED PROJECT – PALEN SOLAR ENERGY GENERATING SYSTEMS (PSEGS)

The PSEGS amendment seeks to replace the parabolic trough solar collection system and associated HTF with solar tower technology. The solar tower technology creates steam to run the electricity generator by using a field of 85,000 elevated mirrors known as heliostats. Each heliostat is mounted on a pylon that is approximately 12 feet tall and guided by a sun-tracking system designed to focus the sun's rays on a solar receiver steam generator (SRSG) atop a 750-foot solar tower located near the center of each solar field. Access to the site will remain the same as the PSCP with an access road from Corn Springs Road. The interconnection to the regional transmission grid at SCE's Red Bluff Substation, which is currently under construction, will also remain unchanged. The proposed PSEGS is comprised of two adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW of electricity. The Reduced Acreage Alternative is comprised of the western solar field (i.e., Unit 1) with associated facilities plus 70 acres from the eastern solar field, with a total combined nominal output of approximately 250 MW. The adjacent 218-acre common area and construction lay-down area adjacent to PSEGS Unit 1 would be retained in the Reduced Acreage Alternative. Palen Solar Holdings (PSH) proposes to develop the PSEGS in two operational units, each consisting of one solar field, one tower, and a power block

capable of producing approximately 250 MW of electricity. (See **Project Description - Figures 4, 5, 6, and 7.**) (Ex. 2000, p. 3-2.)

Two natural-gas-fired auxiliary boilers are proposed for each power block for a total of four boilers for the project, whereas the Reduced Acreage Alternative would only have one power block with two boilers. PSEGS uses a startup boiler during the morning start-up cycle to assist the power generation equipment in coming up to operating temperature more quickly and for augmenting the solar operation when solar energy diminishes or during transient cloudy conditions. Each solar field also contains a night preservation boiler to provide steam to the gland systems of the steam turbine and boiler feed-water pump turbine to prevent air ingress during shutdown periods when steam is not available from the SRSG. This boiler will also provide pegging steam to the generator during these shutdowns. (Ex. 2000, p. 3-2.) The Reduced Acreage Alternative would have all of the features of one solar field as described above.

The two power plants would share common facilities, including an on-site switchyard, a single-circuit 230-kV generation tie-line, and a common area containing an administration building, warehouse, evaporation ponds, maintenance complex, and a meter/valve station for incoming natural-gas service to the site. Other on-site facilities include access and maintenance roads (either dirt, gravel, or paved), perimeter fencing, tortoise fencing, and other ancillary security facilities. (Ex. 2000, pp. 3-2 – 3-3.) The Reduced Acreage Alternative would only require one evaporation pond in the common area (Ex.1166 p.1).

The PSEGS footprint covers 572 fewer acres than the original footprint of the PSPP. While the PSPP included the use of approximately 40 acres of a private parcel located in the northeast portion of the site, the PSEGS does not include any development within this private parcel. (Ex. 2000, p. 3-3.)

The primary PSEGS modifications to the PSPP are:

- Two 250-MW power-generating units, each consisting of a dedicated field of approximately 85,000 heliostats, a 750-foot solar tower and receiver, and a power block;
- An approximately 15-acre common facilities area located in the southwestern corner of the site, with an administrative/warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the PSPP);
- An approximately 203-acre temporary construction lay-down area located in the southwestern portion of the site immediately north of the common facilities area;
- Re-routing of the generation tie-line near the western end of the route and around the newly constructed Red Bluff Substation; the purpose of this re-routing is to align

the PSEGS generation tie-line route immediately adjacent to the NextEra Desert Sunlight generation tie-line to minimize crossings over I-10 and to ensure easy entry into the Red Bluff Substation nearest the PSEGS breaker position;

- Removal of the secondary emergency access road and addition of two secondary access gates for emergency vehicles to enter the site;
- Re-routing of the redundant telecommunication line along the generation tie-line route;
- Natural-gas delivery from a new extension of the existing Southern California Gas (SoCal Gas) distribution system to the project boundary;
- Reduction of the project footprint from 4,366 acres to 3,794 acres;
- Reduction of the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface;
- Reduction of the amount of water used by 99 acre-feet per year (AFY); and
- An increase in NOx emissions from the use of the auxiliary boilers. (Ex. 2000, p. 3-3.)

The Reduced Acreage Alternative would have the same basic features as described for the PSEGS, except that there would be just one 250 MW power generating unit occupying approximately 1,960 acres. Water needs would be reduced by approximately half. (Ex. 1169.)

### **Common Facilities Area**

A 15-acre common facilities area on the southwestern corner of the site would accommodate an administration, warehouse, and maintenance complex, and an asphalt-paved visitor and employee parking area. The common facilities area would also contain two 2-acre evaporation ponds, whereas the Reduced Acreage Alternative would only require one. The administration complex will be served by power from the local 12.47-kV distribution system and by water from wells located in the common facilities area. The common facilities area would also be used for a temporary construction lay-down area. (Ex. 2000, p. 3-3 – 3-4.)

## **Access Roads and Drive Zones**

Primary access to the site during both construction and operation would be via a new 1,350-foot-long/24-foot-wide paved road entering from Corn Springs Road. The access road would be constructed from a point just north of the I-10/Corn Springs Road entrance/exit ramps east to the project site entrance, and would include a 12-foot-wide gravel-surfaced shoulder for truck staging to avoid traffic interferences. (Ex. 2000, p. 3-4.)

Internal roadway and utility corridors would be installed for each power-generating unit (comprised of a heliostat field, solar tower, and power block). Each unit would provide access via a 20-foot-wide, paved or hardscaped road running from the entrance of the PSEGS site to the power block and then around the power block. (Ex. 2000, p. 3-4.)

In addition to the paved access road to the power block of each unit, 12-foot-wide unpaved roads would radiate out from each power block to provide access through the heliostat fields to a 12-foot-wide unpaved perimeter road running five feet inside of and parallel to the boundary fence. PSEGS personnel would use this road to monitor and maintain perimeter security and tortoise exclusion fencing. This road would be grubbed, bladed, and smoothed to facilitate safe use with minimal grading where necessary to cross washes. Within each heliostat field, 10-foot-wide dirt roads would run concentrically around the power block to provide access to the heliostat mirrors for maintenance and cleaning. These concentric roads would be approximately 152 feet apart and would be grubbed to remove vegetation and be smoothed. (Ex. 2000, p. 3-4.) The road and utility corridor description above would be altered by the Reduced Acreage Alternative, which would be applicable only to the western unit.

## **Lighting**

The lighting system would provide personnel with illumination for operation under normal conditions, for egress under emergency conditions, and emergency lighting to perform manual operations during an outage of the normal power source. The system would also provide 120-volt AC convenience outlets for portable lamps and tools. Exterior light fixtures would utilize technologies to reduce light pollution. (Ex. 2000, p. 3-4.)

## **Temporary Construction Lay-down Area**

The 203-acre temporary construction lay-down area on the west side of the site would be used for equipment lay down, construction parking, construction trailers, a tire cleaning station, heliostat assembly, a temporary concrete batch plant, and other construction support facilities. The surface areas within the temporary construction area that would be used frequently would be stabilized with a layer of crushed stone in areas subject to heavy daily traffic. (Ex. 2000, pp. 3-4 – 3-5.)

## **Process Description**

In each unit, the SRSG would send steam to the Rankine-cycle steam turbine to generate electricity. The solar field and power generation equipment would start each morning after sunrise and would shut down (unless augmented by the auxiliary boiler) when insolation drops below the level required to keep the turbine on line. Each unit would be equipped with two natural-gas-fired auxiliary boilers that could also be used to extend daily power generation. However, on an annual basis, the natural gas used as a supplement to power generation would be limited to below two percent of the annual energy output of the PSEGS. (Ex. 2000, p. 3-5.)

Each unit would use an air-cooled condenser (ACC) for the main steam cycle. A wet surface air cooler (WSAC) would be used for auxiliary equipment cooling. Raw water would be drawn daily from on-site wells located in each power block and in the common area adjacent to the administration building. Groundwater would be treated in on-site treatment systems and would be used for mirror washing, WSAC makeup, and process water makeup. (Ex. 2000, p. 3-5.)

Each of the power blocks would be connected via underground electrical cables to the on-site switchyard in the northern area of the site. Each power block would also have a gas-metering set. Permanent parking areas would be provided at each power block for operations and maintenance personnel. (Ex. 2000, p. 3-5.) The Reduced Acreage Alternative would be limited to one generating unit with corresponding reductions for each component discussed above.

## **Power Cycle**

Solar energy is reflected by the heliostats onto the SRSG where the energy heats water into superheated steam. The steam is then routed to the steam turbine generator (STG) where the energy in the steam is converted to electrical energy. (Ex. 2000, p. 3-5.)

Following expansion through the steam turbine, exhaust steam is directed to the air-cooled condenser. The ACC blows ambient air across a heat transfer surface area to cool and condense the steam. The condensed steam is collected in a condensate tank and returned to the SRSG via a series of feed-water heaters and pumps. (Ex. 2000, p. 3-5.)

## **Solar Field**

The heliostat assembly is composed of two mirrors, each approximately 12 feet high by 8.5 feet wide, with a total reflecting surface of 204.7 square feet. The heliostat assembly is mounted on a single pylon along with a computer-programmed aiming-control system that directs the motion of the heliostat to track the movement of the sun. Pylon height may vary due to specific site conditions, but they are generally 6.23 feet tall.

Communication between the heliostats and the operations center would occur via surface-mounted anchored cable or a wireless remote system. (Ex. 2000, p. 3-5.)

### **Generating Units**

Each of the two 250-MW units is contained within a solar power tower structure that is approximately 620 feet tall. The SRSG located at the top of the solar power tower is approximately 130 feet tall, resulting in an overall tower height of approximately 750 feet (not including a lighting appurtenance). (Ex. 1003, p. 2-8; 2000, p. 3-6.)

No heliostat would be installed closer than 260 feet from the solar power tower location. For Unit 1, the distance between the solar power tower and the farthest heliostat in the solar field is approximately 8,456 feet to the northeast section of the heliostat array. For Unit 2, the longest distance between the solar power tower and the farthest heliostat in the solar field is approximately 8,966 feet to the east section of the heliostat array. (Ex. 1003, p. 2-8; 2000, p. 3-6.) With the Reduced Acreage Alternative, there would be no Unit 2.

### **Steam Turbine Generator and Air-Cooled Condenser**

The unit would contain a non-reheat Rankine-cycle STG with a gland steam system, lubricating oil system, hydraulic control system, and steam admission/induction valving. High pressure (HP) steam from the SRSG super heater enters the HP steam turbine section and expands through multiple stages of the turbine, driving a generator to produce electricity. On exiting the Low Pressure (LP) turbine, the steam is directed into the ACC. (Exs. 1003, p. 2-9; 2000, p. 3-6.)

The turbine would consist of high/intermediate-pressure and low-pressure sections. Superheated steam enters the HP turbine casing at 2,466 pounds per square inch absolute (psia) and 1,085 degrees Fahrenheit (°F) at the Normal Continuous Rating. (Ex. 1003, p. 2-9; 2000, p. 3-6.)

Following expansion through the HP turbine, the steam is conveyed to the inlet of the intermediate pressure turbine. Exhaust steam from the turbine is directed to the ACC. The ACC blows ambient air across a heat transfer surface area to cool and condense the steam. The condensed steam is gathered in a condensate tank and provided to the feedwater circuit through a condensate pump. The ACC normally operates at a pressure of 3.25 inches of mercury absolute (approximately 1.6 psia). (Ex. 1003, p. 2-9; 2000, p. 3-6.)

## Natural Gas Boilers

The unit contains two natural-gas-fired boilers to assist with daily startup of the power generation equipment and to preserve energy in the steam cycle overnight. The unit would contain the following boiler equipment:

- One 249-MMBtu/hr (Million Metric British thermal units per hour) packaged natural-gas-fired auxiliary boiler for startup and cycle augmentation, capable of producing 185,000 pounds per hour (lb/hr) at 770°F and 650 psia; and
- One 10-MMBtu/hr natural-gas-fired “night preservation” boiler to maintain system temperatures overnight, capable of producing 10,000 lb/hr at 500°F and 175 psia. (Ex. 2000, p. 3-6.)

## Major Electrical Equipment and Systems

The bulk of the electric power produced by the facility would be transmitted to the grid. Approximately 22 MW of electric power would be used on site to power auxiliaries such as the ACC, pumps and fans, control systems, and general facility loads, including lighting, heating, and air conditioning. Some power would also be converted from alternating current (AC) to direct current (DC) and stored in batteries, which would be used as back-up power for the plant control systems and essential uses. Emergency power would be provided by two diesel generator sets (one in each power block), each with 2,500-kW output capacity and one diesel generator set in the common area (with a 250-kW output capacity). (Ex. 2000, p. 3-6.) Consistent with the description of the Reduced Acreage Alternative in the **ALTERNATIVES** section of this Decision, there would be only one power block and one diesel generator set.

## Mirror Washing

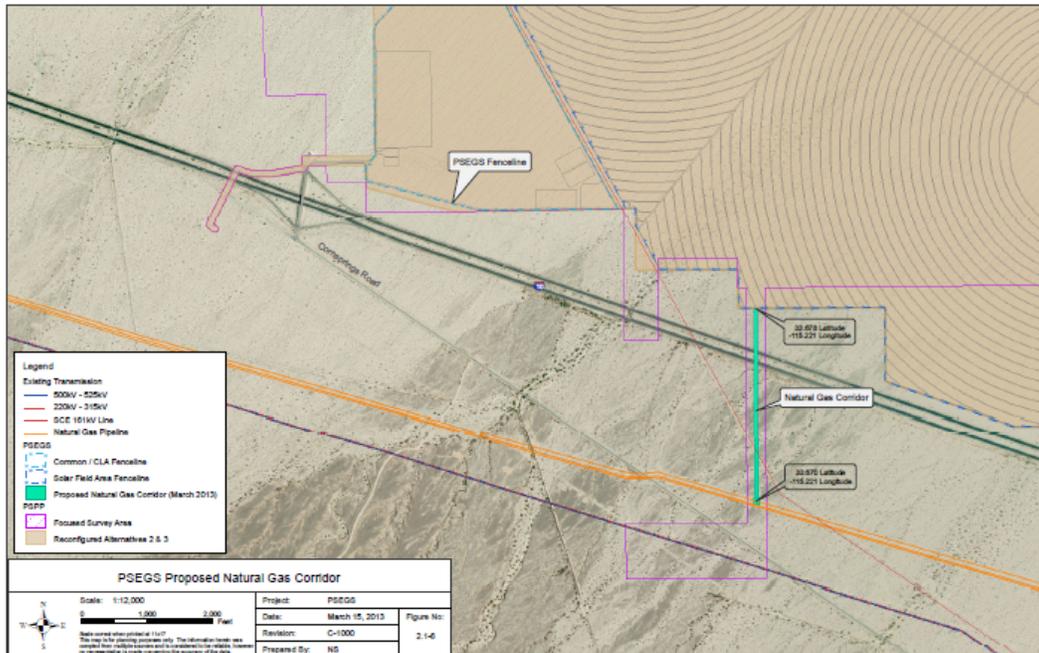
The majority of mirror washing activities are planned to be performed at night, with a small minority of the washing activities to be performed in the daytime during plant operation. Mirror washing would be performed by a mobile mirror washing machine. The mirror washing machine would travel along the ring roads and, in a stationary position, use a remote boom to access all heliostats within a 100-foot radius of its location. (Ex. 2000, p. 3-6.)

When mirrors would be washing during the daytime, the heliostats would be constrained either by direction or elevation. Directional constraint means that the heliostats would be limited in terms of direction so that all heliostats remain facing generally toward the tower (and not toward the boundary of the project). Elevational constraint means that, depending on its range and relative direction from the washing machine, each heliostat would be limited to a vertical position (like in sleep orientation) or a horizontal (wind stow) position. (Ex. 2000, pp. 3-6 – 3-7.)

## **Natural Gas Supply**

The PSPP did not include a natural-gas-supply pipeline, but rather was approved to use LPG for its auxiliary fuel. The PSEGS would use natural gas to fire its auxiliary and nighttime preservation boilers. SoCal Gas would supply natural gas for PSEGS via a new pipeline that would extend southward from the site and interconnect with an existing SoCal Gas transmission pipeline located just south of I-10. The new gas pipeline approximately eight inches in diameter and 2,956 feet long would be constructed within a previously-surveyed corridor as shown in **Project Description - Figure 4**. SoCal Gas would construct, own, and operate the new gas pipeline as part of its extensive gas supply system. (Ex. 2000, p. 3-7.)

## Project Description - Figure 4 – PSEGS Natural Gas Corridor



(Ex. 1008, p. 2.)

### Water Supply and Use

Primary water uses consist of replacing boiler blow-down, providing supplemental cooling for plant auxiliary systems, and water for washing the heliostats to ensure they function at full performance. The Final Decision allowed the PSPF to use up to 1,917 AFY of water from up to 10 groundwater wells during construction (for a total of 5,750 acre-feet during the 39-month-long construction period) and 300 AFY during operation. The PSEGS would utilize the same number of groundwater wells, but would only use up to 400 acre-feet during construction (for a total of 1,130 acre-feet during the construction period) and up to 201 AFY during operation. The well water would be used for process make-up, mirror washing, and domestic uses. (Ex. 2000, p. 3-7.) The Reduced Acreage Alternative, which is only Phase I of the PSEGS, would require approximately 204 acre-feet during construction and up to 101 AFY during operation, and half the groundwater wells as was proposed in the PSEGS. (Ex. 1169.)

Each unit would have a raw water tank with a capacity of 800,000 gallons. A portion of the raw water (200,000 gallons) is for plant use, while the majority will be reserved for fire water. The common area would also contain a combined service water/firewater tank with a capacity of 480,000 gallons. The water treatment plant would operate continuously in order to minimize water treatment system size and capital cost. (Ex. 2000, p. 3-7.)

## Water Requirements

A breakdown of the estimated average daily quantity of water required for PSEGS during operation is presented in **Project Description - Table 1**. The daily water requirements shown are estimated quantities based on the PSEGS operating at full load. (Ex. 2000, p. 3-8.)

**Project Description - Table 1**  
**Average Daily Water Requirements (Both Units)**

Use	Average Daily Use*		Annual Average Use
	gpm	gpd	AFY
Process Uses	63	90,873	102
Mirror Washing	44	63,408	71
Potable Water	2.1	2,995	3.4
Dust Suppression	15	21,802	24.4
Total	124	179,078	201

\*Average Daily Use is based on annual operating hours of 3,500 hours/year. gpd = gallons per day. gpm = gallons per minute. AFY = acre-feet per year. (Ex. 2000, p. 3-8.)

## Plant Cooling Systems

The cycle heat rejection system for the main steam cycle consists of an ACC system. The heat-rejection system receives exhaust steam from the low-pressure section of the steam turbine and feed-water heaters, and then condenses it back to water for reuse. The condenser removes heat from the condensing steam up to a maximum of 1,140 MMBtu/hr, depending on ambient temperature and plant load. (Ex. 2000, p. 3-8.)

A WSAC cools the generator, steam turbine generator lubrication oil, boiler feed pump lubricating oil, SRSG circulating water pumps, and other equipment requiring cooling. The WSAC uses reverse osmosis (RO) brine mixed with filtered well water for cooling. A 40 percent propylene glycol/60 percent demineralized water mixture is used in the closed cooling water loop to provide freeze protection. (Ex. 2000, p. 3-8.)

## Waste Management

Waste management is the process whereby all wastes produced at the project site are properly collected, treated (if necessary), and disposed of. Project wastes would consist primarily of non-hazardous solid and liquid wastes with lesser amounts of hazardous wastes and universal wastes. The non-hazardous solid wastes would be construction

and office wastes, as well as solid wastes from the water treatment system. The non-hazardous solid wastes would be trucked to a nearby Class II or III landfill. Non-hazardous liquid wastes would consist primarily of domestic sewage and wastewater streams such as RO system reject water, boiler blow-down, and auxiliary cooling tower blow-down. A septic tank and leach field system would be installed to manage domestic sewage. All other waste streams would be either recycled or sent to the evaporation ponds. (Ex. 2000, p. 3-9.) The above waste management description applies to the Reduced Acreage Alternative, except that there would only be one evaporation pond.

### **Fire Protection**

The fire protection system would be designed in accordance with applicable regulations, standards, and codes to protect personnel and limit property loss and plant downtime in the event of a fire. The service/firewater storage tank located at each power block and the firewater storage tank in the common area would be the primary source of fire protection water. An electric jockey pump and electric motor-driven main fire pump would be installed for the common area and for each power block to maintain the water pressure in the fire main at the level required to serve all fire-fighting systems. In addition, a back-up 204-hp diesel engine-driven fire pump would be provided for the common area and each power block to pressurize the fire loop if the power supply to the electric motor-driven main fire pump failed. A fire pump controller would be provided for each fire pump. (Ex. 2000, p. 3-9.)

The fire pumps would discharge to a dedicated underground firewater loop-piping system. Normally, the jockey pumps would maintain pressure in the firewater loop. Both the fire hydrants and the fixed-suppression systems would be supplied from the firewater loop. Fixed fire suppression systems would be installed at determined fire risk areas such as the transformers and turbine lube oil equipment. Sprinkler systems would also be installed in the administration complex buildings and fire pump enclosure as required by National Fire Protection Association (NFPA) and local code requirements. Hand-held fire extinguishers of the appropriate size and rating would be located in accordance with NFPA 850 throughout the power block and common area. Generator step-up transformers and other oil-filled transformers would be contained and provided with a deluge system. On-site personnel would be trained in the use of fire protection equipment and would be the first responders to an incident. (Ex. 2000, p. 3-9.)

The PSEGS is located such that it would fall under the jurisdiction of the Indio Office of the Riverside County Fire Department. Based on the requirements of Riverside County Ordinance No. 787.1, the piping system supplying the fire hydrants must be sized to convey a potential firewater flow rate of 5,000 gpm. Minimum firewater storage volume in each power block would be 600,000 gallons. Firewater would be supplied from a combined service water/firewater storage tank located at each power block. One electric

primary and one diesel-fueled backup firewater pump, each with a capacity of 5,000 gpm, would deliver water to the fire protection piping network. Fire protection for the solar fields is not required since no combustible materials would be present in the solar field areas. (Ex. 2000, pp. 3-9– 3-10.)

The common area fire protection system would be sized to comply with LORS and would consist of one electric primary pump and one diesel-fueled backup firewater pump. Firewater would be supplied from the combined service water/firewater storage tank with a storage volume of 480,000 gallons. (Ex. 2000, p. 3-10.)

With the exception of the service/firewater storage tank and other equipment specifically designed for Unit 2, the Reduced Acreage Alternative would retain the same on-site fire protection system. The fire protection services needed from RCFD during construction and operations for both PSEGS and the Reduced Acreage Alternative would essentially be the same. (Ex. 2000, 6.1-83.)

## **CONSTRUCTION AND OPERATION**

PSEGS would have an average construction workforce of 998 and a peak workforce of approximately 2,311. Construction is expected to take 34 months. The Reduced Acreage Alternative would likely require an average workforce of 603 and a peak workforce of approximately 1241. Construction under this Reduced Acreage Alternative is expected to last 28 months. (Ex 1168.)

The PSEGS would require much less grading than the PSPP because the heliostat technology would not require an entirely flat surface. (Exs. 1003, p. 4.1-16; 2000, p. 3-10.)

The site fence would be installed concurrently with the Desert Tortoise's survey process. Project construction begins with the building of site roads and the installation of temporary construction facilities, including office trailers, parking areas, material lay-down areas, a concrete batch plant, and a heliostat assembly facility. The construction of each generating unit would begin with grading and construction of earthen berms around the power block areas to divert storm water, followed by the excavation and placement of foundations and other underground facilities. Superstructures and equipment would then be placed on the foundations. Major items would include the 750-foot-tall solar power tower and SRSG, the STG pedestal and STG, and the ACC. Once the mechanical equipment is in place, construction would continue with the installation of the piping, electrical equipment, and cables necessary to connect and power the equipment. Upon completion of construction, the checkout, testing, startup, and commissioning of the various plant systems would begin, resulting in a fully-operational generating unit. (Ex. 2000, p. 3-10.)

After required grading in the heliostat fields, the heliostats would be installed in two steps. Initially, the support pylons would be installed using vibratory technology to insert the pylons into the ground to a depth of up to 12 feet. (Pre-augering prior to the installation of the pylon may be required.) The heliostat assembly (mirrors, support structure, and aiming system) is mounted on the pylon. Pylons would be delivered to their locations by an all-terrain vehicle. Installation of the heliostat assemblies would be performed by a rough-terrain crane. (Ex. 2000, p. 3-10.)

The majority of the project site would maintain the original grades and natural drainage features; therefore, no additional storm drainage control is proposed. The storm water management design for the I-10 freeway includes three drainage culverts to allow rain to flow from south to north underneath the freeway. To minimize wind and water erosion, open spaces would be preserved and left undisturbed, maintaining existing vegetation to the extent possible. If needed, stone filters and check dams would be strategically placed throughout the project site to provide areas for sediment deposition and to promote the sheet flow of storm water prior to leaving the project site boundary. During construction, trenches would be excavated for the installation of electrical transmission system conductors and the on-site natural-gas system. Typical trench dimensions would be 2–3 feet wide at the base and 3–6 feet deep. A few trenches may have widths and/or depths of up to 12 feet. (Ex. 2000, p. 3-10– 3-11.)

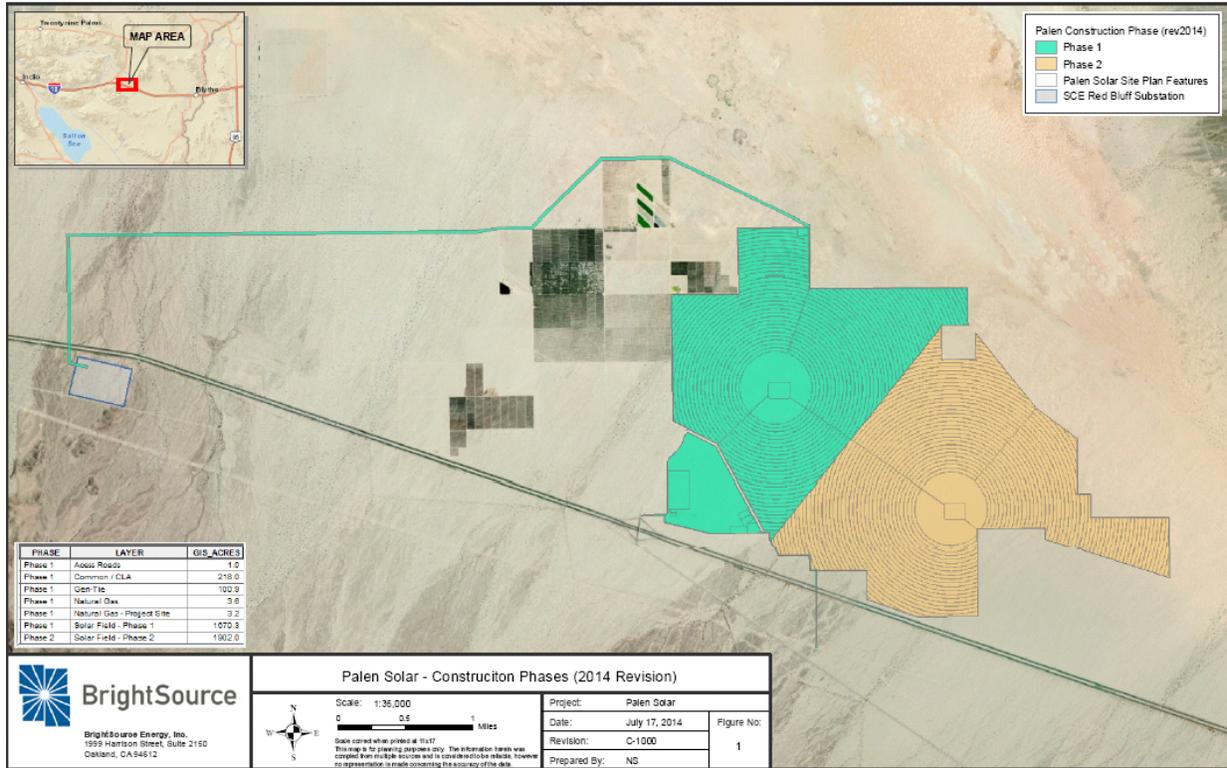
During operations, the PSEGS would employ up to 100 full-time employees as follows: 30 at Unit 1 (including mirror washing machine operators), 30 at Unit 2 (including mirror washing machine operators), and 40 at the administration complex. The facility would operate seven days a week. Heliostat washing is projected to occur up to 24 hours per day (including nighttime mirror washing), covering the entire solar field weekly. (Ex. 2000, p. 3-11.) The Reduced Acreage Alternative would not require the Unit 2 employees.

The facility would operate at its maximum continuous output for as many hours per year as solar input allows, or as limited by contractual terms and conditions. A full shutdown may occur due to equipment malfunction, transmission or gas line disconnection, or scheduled maintenance. (Ex. 2000, p. 3-11.)

## **Phasing Plan**

The original phasing plan identified areas within the power blocks of units, the common area, and the linear facilities as Phase I. The remainder of the PSEGS facilities was identified as Phase II. Petitioner's proposed new phasing plan includes all of Unit 1 (the western-most solar field and power block), the common area and construction lay-down area, the project switchyard, the access road, the natural-gas pipeline, and the generation tie-line as Phase I. See **Project Description - Figure 5 – PSEGS Revised Phasing Plan**, which depicts the Revised Phasing Plan.

## Project Description - Figure 5 – PSEGS Revised Phasing Plan



(Ex. 1167.)

The Revised Phasing Plan does not require substantial changes to the grading and drainage design of the project. Unlike the PSPPP project, the drainage design for the PSEGS allows most of the storm water to run through the site rather than the use of large diversion structures to divert storm water around the site. In general, the grading plan for the entire site relies on utilizing the existing drainage pattern and minimizing disturbance to native grades. (Ex. 1166, p. 2.)

The drainage concept for Phase II was basically to cut and fill the area needed for the power block and to add a diversion berm/swale on the up-gradient side of the site in order to convey storm water drainage around the power block and then release the storm water back to existing grades once past the development. Therefore, if Phase II was to be constructed subsequent to Phase I rather than concurrently with Phase I, that area encompassing Phase II would be left undisturbed until needed, including each entry point for the access roads inside of the nearest circular dirt road. (Ex. 1166, pp. 2 - 3.)

The existing conditions of certification require a Final Drainage Erosion and Sediment Control Plan and grading plans to be approved by the CPM prior to construction. That review would allow any minor modifications to the preliminary plans to be reviewed to ensure compliance with the clear performance standards outlined in the conditions. (Ex. 1166, p. 3.)

The Reduced Acreage Alternative only consists of Phase I of the proposed phasing plan. Staff concurred with Petitioner that no further analysis is necessary and that the Reduced Acreage Alternative with a single power tower would either have a beneficial effect or no effect at all. (7/30/14 RT 29:19-34;20.) Subsequent phases are not part of the Reduced Acreage Alternative.

### **Thermal Energy Storage**

To further California's renewable energy goals, and consistent with Petitioner's Supplemental Opening Testimony regarding incorporation of Thermal Energy Storage (TES) in the future, Petitioner proposed that construction of Phase II (the eastern-most unit) be conditioned upon the filing, and Commission approval of, a future amendment that would present modifications to the currently-designed Phase II to incorporate TES. Petitioner's proposed Condition of Certification **PROJECT DESCRIPTION – 1** would require an amendment incorporating TES prior to construction of Phase II. (Ex. 1166, p. 3.)

Intervenor CBD argues that Condition of Certification **PROJECT DESCRIPTION-1** is illusory because "petitioner believes it would retain the option to seek to have the condition removed." (8/15/14 CBD Opening Brief, p. 18.) However, this issue has been rendered moot in light of our decision to certify the Reduced Acreage Alternative with a single power tower.

CRIT argues that the PSEGS future addition of thermal energy storage described in the phasing plan must be analyzed now pursuant to Cal. Code Regs., tit. 14, § 15126. (8/15/14 CRIT Opening Brief, pp. 14-15.) According to Petitioner's Opening Brief, thermal energy is not actually proposed at this time. Exhibit 1125 describes the process and probable equipment necessary to incorporate thermal energy storage into the PSEGS facility should it be proposed in a petition to amend at some future date. (Ex.1125, pp. 2-6.) Exhibit 1129 shows a drawing showing the potential placement of the TES equipment. The future inclusion of thermal energy storage would not change the footprint of the project. (Exs.1125, pp. 2-6; 1129.) We are satisfied that the record contains a sufficient description of how a future upgrade of the power plant to include thermal energy storage would fit into the whole of the project, even though it is not proposed at this time.

The Presiding Member of the PSEGS Committee clearly articulated the Energy Commission's support of thermal energy storage. (1/7/14 RT 13:11 – 24.) The Petitioner's position that the PSEGS project could be upgraded to include thermal energy storage raises the level of the project's benefits in our view. We welcome petitions to amend to add thermal energy storage, and we encourage the inclusion of thermal energy storage in future renewable project AFCs, particularly for projects such as PSEGS, which uses power tower technology and which is uniquely well suited to thermal energy storage. (Ex. 1206; 7/30/14 RT 128:3 – 10; 167:3-172:19; 172:2 – 18; 208:5 - 23.)

We find that the issue of including thermal energy storage in the second phase is moot since we have elected to certify the Reduced Acreage Alternative with a single power tower. The Petitioner's testimony established that thermal energy storage could not be added to the PSEGS first phase under the terms of its current Power Purchase A. (10/29/14 RT 86:8 – 22.) On the other hand, evidence established that adding thermal energy storage to the PSEGS design is technically feasible and is becoming more financially feasible. (Exs. 1125; 1147; 1148; 7/30/14 RT 175:1 – 16.) The PSEGS project owner would be welcome to amend its certification to add thermal energy storage if the opportunity arises.

### **Cumulative Impacts**

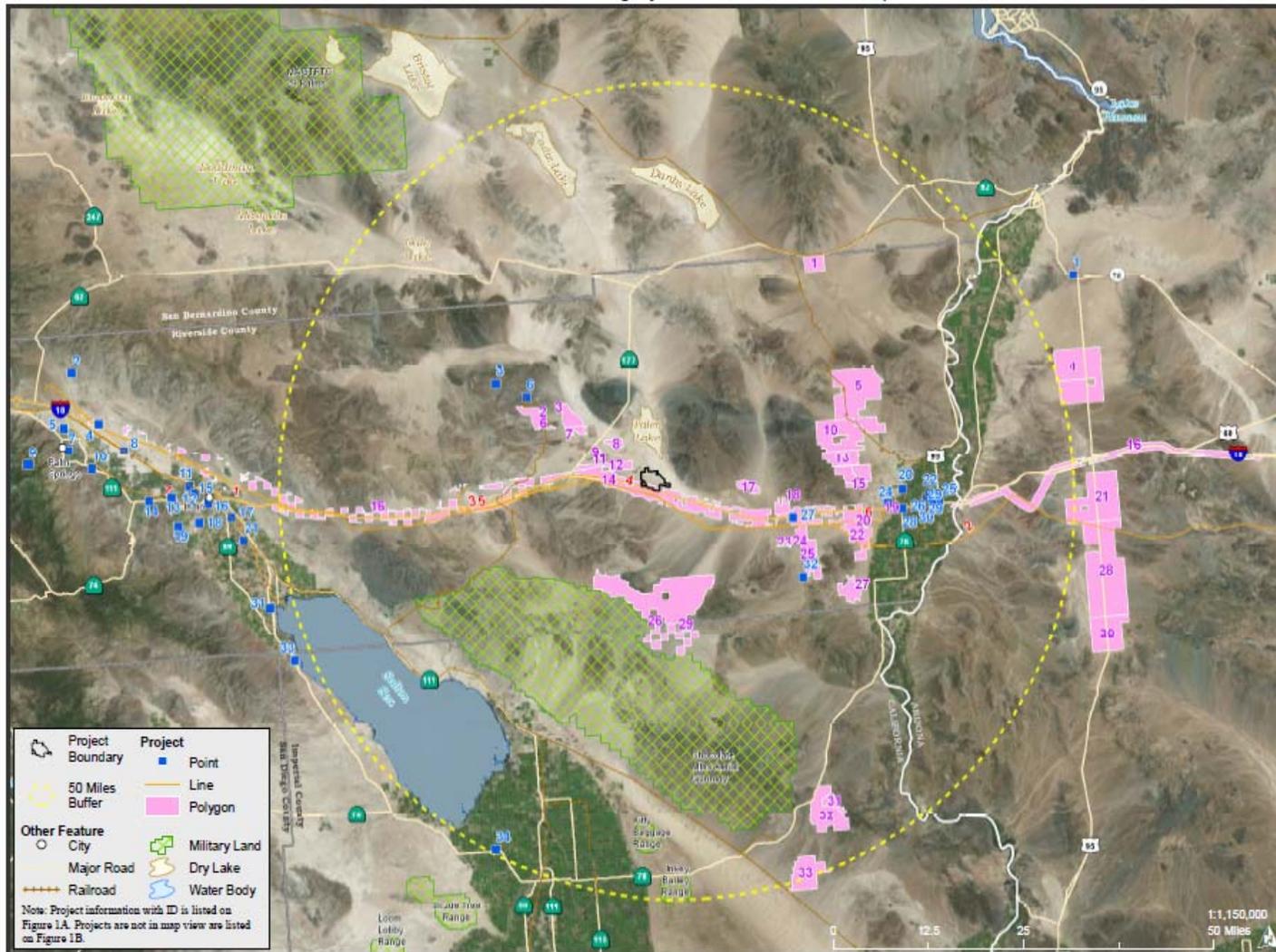
Preparation of a cumulative impact analysis is required under CEQA. In the CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts" (14 Cal. Code Regs., §15130(a)(1)). Cumulative impacts must be addressed if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable" (14 Cal. Code Regs., §15130(a)). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects" (Cal. Code Regs., tit. 14, §15164(b)(1)). Together, these projects comprise the cumulative scenario that forms the basis of the cumulative impact analysis. (Ex. 2000, p. 1-30, **Appendix A.**)

CEQA also states that both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, "but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by the standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects that do not contribute to the cumulative impact" (14 Cal. Code Regs., §15130(b)). (Ex. 2000, p. 1-30, **Appendix A.**)

## **Definition of the Cumulative Project Scenario**

Cumulative impacts analysis is intended to identify past, present, and probable future actions that are closely related either in time or location to the project being considered, and consider how they have harmed or may harm the environment. Most of the projects listed in the cumulative projects tables below (**Project Description - Tables 2, 3, and 4**) have, are, or will be required to undergo their own independent environmental reviews under CEQA. **Project Description - Figure 6** depicts the relative proximity of pending projects considered in the vicinity of the PSEGS project.

**Project Description - Figure 6 – PSEGS Area Projects**



**Project Description – Table 2**

Project Description

### Existing Projects

OID	Project Name	Location	Ownership	Status	Project Description	Distance (Mile)	Feature
1	2012 Air Quality Management Plan	Orange, Los Angeles, Riverside, and San Bernardino Counties	South Coast Air Quality Management District	Lead agency approved the project on 12/12/2012, and will have significant impacts	The 2012 AQMP identifies control measures to be implemented by state, federal, and local agencies to demonstrate that the region will attain the federal standard for particulate matter less than 2.5 microns in diameter (PM2.5) by the applicable target dates and provides Clean Air Act S182(e)(5) proposed implementation measures to assist in achieving the 8-hour ozone standard	0.00	Polygon
15	Blythe Energy Project	City of Blythe, north of Interstate 10, 7 miles west of the CA/AZ border	Blythe Energy, LLC	Existing	520 MW combined-cycle natural-gas-fired electric generating facility. The project is connected to the Buick Substation owned by WAPA.	30.78	Point
17	Blythe Energy Project Transmission Line	From the Blythe Energy Project to Julian Hinds Substation	Blythe Energy, LLC	Existing	Transmission line modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation, and SCE's DPV 500 kV transmission line	1.92	Line
19	Blythe PV Project	Blythe	First Solar	Existing	21 MW solar photovoltaic project located on 200 acres	27.82	Polygon
28	Chuckwalla Valley State Prison	19025 Wiley's Well Rd., Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	State prison providing long-term housing and services for male felons classified as medium and low-medium custody inmates jointly located on 1,720 acres of state-owned property	19.95	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (Mile)	Feature
43	Devers-Palo Verde No. 1 Transmission Line	From Palo Verde (Arizona) to Devers Substation	SCE	Existing	Existing 500 kV transmission line parallel to Interstate 10 from Arizona to the SCE Devers Substation, near Palm Springs. DPV1 will loop into the approved Midpoint Substation, which will be located 10 miles southwest of Blythe.	1.87	Line
49	Eagle Mountain Pumping Plant	Eagle Mountain Rd, west of Desert Center	Metropolitan Water District of Southern California	Existing	144-foot pumping plant that is part of the Metropolitan Water District of Southern California's facilities	21.36	Point
78	Interstate 10	Linear interstate highway running from Santa Barbara to Blythe	Caltrans	Existing	Interstate 10 is a major east-west route for trucks delivering goods to and from California. It is a four-lane divided highway in the project region.	1.28	Line
81	Ironwood State Prison	19005 Wiley's Well Rd., Blythe, CA	CA Dept. of Corrections & Rehabilitation	Existing	ISP jointly occupied with Chuckwalla Valley State Prison 1,720 acres of state-owned property, of which ISP encompasses 640 acres. The prison complex occupies approximately 350 acres with the remaining acreage used for erosion control, drainage ditches, and catch basins	18.81	Polygon
84	Kaiser Mine	Eagle Mountain, north of Desert Center	Kaiser Ventures, Inc	Existing	Kaiser Street mined iron ore at Kaiser Mine in Eagle Mountain and provided much of the Pacific Coast steel in the 1950s. The mining project also included the Eagle Mountain Railroad, 51 miles long; closed in 1980s.	23.84	Point
121	Recreational Opportunities	Eastern Riverside County	BLM	Existing	BLM has numerous recreational opportunities on lands in eastern Riverside County along the Interstate 10 corridor, including the Corn Spring's Campground, Wiley's Well Campground, Coon Hollow Campground, and Midland Long-Term Visitor Area.	23.07	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (Mile)	Feature
167	West-wide Section 368 Energy Corridors	Riverside County, parallel to DPV corridor	BLM, Department of Energy (DOE), U.S. Forest Service	Approved by BLM and U.S. Forest Service	Designation of corridors on federal land in the 11 western states, including California, for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). One of the corridors runs along the southern portion of Riverside County.	0	Polygon

**Project Description – Table 3  
Foreseeable Projects in the Project Area**

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
2	6th Street/CA Avenue/Maple Avenue Sewer Line Extension Project	6th St and Xenii, Maple Ave and 1st St, CA Ave and 1st St, Beaumont	City of Beaumont	Negative declaration filed on 11/5/2012	Extension of an 8" sewer line	102.53	Point
3	ACI Residential Project	Citrus St. and Cleveland Ave. Eastvale	City of Eastvale	Lead agency approved the project on 2/1/2013, and will not have significant impacts	Streambed Alteration Agreement, limited to the preparation of 38.1 acres of the 85.4 acre APN 152-040-034 for medium-density residential development	136.74	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
4	Adoption of Rule 1406 Generation of ERCs for Paving Unpaved Public Roads	Various locations in Riverside County	Mojave Desert Air Quality Management District	Lead agency approved the project on 2/11/2013, and will not have significant impacts	The objectives of this Project (rule adoption) are to codify existing District procedures, making their application federally enforceable, and to allow PM10 emission reductions generated by unpaved public road paving to be used as offsets for specifically identified permit applications subject to federal New Source Review requirements.	136.12	Point
5	Agua Caliente Indian Reservation	Knowles Property, eastern slope of the San Jacinto Mts. APN: 513-040-021-2	Bureau of Indian Affairs	Review period ends 6/5/2013	Land acquisition	81.63	Point
6	Agua Caliente PV	Between Yuma and Phoenix	First Solar	Under Construction	290 MW solar PV plant on 2,400 acres	110.87	Point
7	Annex 114, SIA 12-001, GPA 12-004, CZ12-002 & ZTA12-002	Unincorporated Temescal Valley, Riverside County	City of Corona	Mitigated negative declaration filed on 12/6/2012	Annexation 114 is an application of the City of Corona to annex the unincorporated area of Temescal Valley in Riverside County into the city. The Temescal Valley SOI is 15.58 square miles and entirely covers the city's southern sphere of influence	130.06	Point
8	Aqua Caliente Roadway and Drainage Improvements Project	Tahquitz Canyon Way and Hermosa Dr, Palm Springs	City of Palm Springs	Mitigated Negative Declaration filed 2/14/2013	Widening of Hermosa Drive (east half) between Tahquitz Canyon Way and Hermosa Drive to its full-width 40-foot-wide (curb to curb) collector street designation	76.54	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
9	Beaumont Avenue Recharge Facility and Pipeline	Beaumont Ave and Brookside Ave, Beaumont	San Gorgonio Pass Water Agency	Notice of Preparation filed on 11/30/2012	The recharge facility is proposed to be located on a 44-acre parcel and consists of a series of five tiered basin separated by berms. The perimeter of the recharge facility is proposed to include raised embankments. The pipeline is proposed to extend from the recharge facility to the service connection facility. The pipeline will be 24 inches in diameter and will extend north from the recharge facility along Beaumont Avenue for 5,600 linear feet and west along Orchard Street for 1,400 feet.	103.16	Point
10	Beaumont Distribution Center (City Project No. 12-PP-05, 12-RZ-02, and 12-GPA-01)	First St and Beaumont Ave, Beaumont	City of Beaumont	Notice of Preparation filed on 2/14/2013	The proposed project entails the development of an approximately 38-acre site with an 803,600 square foot high cube distribution warehouse facility with a maximum building height of 50 feet.	102.77	Point
11	Bella Linda General Plan Amendment, Zone Change/Planned Development Overlay	Pechanga Parkway (west), Loma Linda (south), Temecula Lane (east), Temecula	City of Temecula	Draft EIR filed on 12/3/2012	The project is a two-phase residential development. Phase one will consist of 325 apartment units totaling 462,622 sq. ft. Phase two of the project will consist of creating lots for 49 senior single-family units. The project will feature a meandering trail along Loma Linda Road and Pechanga Parkway. An additional 0.91 acres of project area is located off-site immediately to the north of the project site.	111.02	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
12	Belle Terre Specific Plan	Washington St and Keller Rd, Riverside County	County of Riverside	Notice of preparation filed on 11/21/2012	The project includes a split foundation Specific Plan that would allow for the development of up to 1,326 residential units and open space and/or recreational features.	108.02	Point
13	Big Maria Vista Solar Project	North of Interstate 10, 12 miles N/W Blythe	Bullfrog Green Energy	POD in to BLM	500 MW PV project on 2,684 acres	28.69	Polygon
16	Blythe Energy Project II	Near Blythe Airport	Blythe Energy	Approved	520 MW combined-cycle power plant located entirely within the Blythe Energy Project site boundary, located on 30 acres of a 76-acre site	30.82	Polygon
18	Blythe Mesa Solar I	Blythe	Renewable Resources Group	Under review	A planned 485 MW solar PV project on private land in Blythe	32.78	Point
20	Blythe Solar Power Generation Station 1	Blythe	Southwestern Solar Power	Approved	A planned 4.76 MW solar PV facility, including 69 PV panels that stand 50 feet tall and 72 feet wide	32.61	Point
21	Blythe Solar Power Project	North of Interstate 10, north of Blythe Airport	Solar Millennium	Approved	1,000 MW solar trough facility on 7,540 acres	26.33	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
22	Bundy Canyon Road and Orange Street Tentative Parcel Map No. 30522	Bundy Canyon Rd and Orange St, Wildomar	City of Wildomar	MND comment period ended 5/1/2013, with no updates as of 5/17/2013	The proposed project includes a TPM 30522 to subdivide two existing parcels, totaling approximately 10.3 acres, into seven parcels (numbered parcels 1-7) for future commercial development. Existing parcels include APN 367-100-026, from which the proposed project would dedicate approximately 0.75 acres along both Bundy Canyon Road and Orange Street of the project site to the City of Wildomar for a right-of-way necessary to accommodate access to/from the future commercial development.	119.02	Point
23	Bundy Canyon/Scott Road Improvement Project	Bundy Cyn Rd/Scott Rd from I-15 to I-215, Lake Elsinore	County of Riverside	Draft EIR submitted on 1/14/2013	The proposed project would widen and realign portions of a six-mile segment of Bundy Canyon Road/Scott Road (from Cherry Street near Interstate 15 on the west to Haun/Zelders Road near Interstate 215 on the east) from its existing two lanes to a four-lane cross-section.	118.71	Point
24	Cactus Avenue PUD	Cactus Ave, Quincy, Brodiaea Ave, Moreno Valley	City of Moreno Valley	Mitigated negative declaration filed 12/13/2012	43.52 acres into 159 single family residential lots within a Planned Unit Development, modifying the zoning from Residential single family 10 (RS10), Residential 10 (R10) and Residential 15 (R15) multi-family to Residential 5 (R5) with lots ranging from 6,000 to 15,298 square feet	113.26	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
25	Canyon Lake Hybrid Treatment Process-Phase I	Canyon Lake	City of Canyon Lake, CA	Expected start date of September 2013	The proposed Project consists of application of alum to Canyon Lake to remove nutrients that contribute to algal blooms. A wide-range of management options, ranging from oxygenation, aeration, mixing, and dredging to application of alum, Phoslock, and other nutrient binders have been considered.	118.84	Point
26	Chuckwalla Solar I	1 mile north of Desert Center	Chuckwalla Solar I	POD in to BLM	200 MW solar PV project on 4,083 acres	6.40	Polygon
27	Chuckwalla Valley Raceway	Desert Center Airport	Developer Matt Johnson	Approved by County of Riverside	5.8 mile racetrack located on 400 acres of land that used to belong to Riverside County and was used as the Desert Center Airport	8.12	Polygon
29	Circulation Element General Plan Amendment	Banning	City of Banning	Project approved 3/26/2013, will not have significant impacts	The City is proposing to amend the General Plan Circulation Element. The proposed General Plan Amendment (GPA) includes a change to the acceptable Level of Service (LOS) for roadway operating conditions from LOS C to LOS D.	99.43	Point
30	Coachella General Plan Update	Coachella	City of Coachella	Notice of Preparation filed 3/8/2013	The City of Coachella Comprehensive General Plan update encompasses future community development plans from now, until 2035. The General Plan will provide long-term planning guidelines for the City's growing population and projected development.	55.27	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
31	College of the Desert West Valley Campus Facilities Master Plan & Phase I Project	Indian Canyon Drive and Tramview Road, Palm Springs	Desert Community College District	Draft EIR Submitted 3/15/2013	West Valley Campus Facilities Master Plan and Phase 1 Project. Total planned development of 650,000 Sq. ft. on 119+ acres. Also includes 30 on-campus dwelling units and 10,000 sf of campus related retail. Phase 1 development of 50,000 Sq. ft..	77.33	Point
32	Colorado River Substation Expansion	10 miles southwest of Blythe	SCE	Approved 7/2011	500/230kV substation, constructed in an area approximately 1000 ft by 1900 ft	35.72	Point
33	Corona Regional Medical Center Expansion	S. Main St and W. Eight St, Corona	City of Corona	Notice of Preparation filed 3/7/2013	Expansion and renovation of the 47-year-old Corona Regional Medical Center	136.05	Point
34	Crystal View Terrace/Green Orchard Place/Overlook Parkway Project	Crystal View Terrace/Green Orchard Place/Overlook Parkway/Kingdom Dr/Victoria/Washington, Riverside	City of Riverside	Draft EIR filed on 12/3/2012	The Project includes four scenarios, each of which represents an alternative set of actions intended to help resolve potential vehicular circulation issues associated with the gates on Crystal View Terrace and Green Orchard Place; address the connection of Overlook Parkway easterly to Alessandro Boulevard; and potentially provide for a future connection to State Route 91	127.53	Point
35	Dawson Road Contractor's Storage Yard Plot Plan #2010-049	North of McLaughlin Rd, south of Ethanac Rd, west of Antelope Rd and east of Dawson Rd, Menifee	City of Menifee	Lead agency approved the project on 12/11/2012, and will not have significant impacts	5.01 acres of land, which includes 5,000 sq.ft. of office and 10,000 s.f. of shop building; construction of a 6,000 sq. ft. office building in proposed Parcel 2; construction of a 10,000 sq. ft. shop	113.00	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
36	Desert Center 50	Desert Center	US Solar Holdings	Under review	A planned 49.5 MW fixed flat panel photovoltaic solar power plant	7.95	Polygon
38	Desert Harvest Solar Project	6 miles north of Desert Center	EnXco	Final document submitted on 11/7/2012	The project would be a 150-megawatt solar photovoltaic facility sited on 1,208 acres of BLM-managed lands north of the community of Desert Center in Riverside County, CA. An associated 220-kilovolt generation-intertie transmission line would be sited within a 204-acre right-of-way on BLM-managed land and 52 acres of non-BLM managed land, which would extend from the solar facility site to the planned Red Bluff Substation.	11.78	Polygon
39	Desert Lily Soleil Project	6 miles north of Desert Center	EnXco	POD in to BLM	100 MW PV plant on 1,216 acres of BLM land	6.87	Polygon
40	Desert Quartzite	South of Interstate 10, 8 miles southwest of Blythe	First Solar	POD in to BLM	600 MW solar PV project located on 7,724 acres adjacent to the DPV transmission line and SCE Colorado Substation	27.55	Polygon
41	Desert Southwest Transmission Line	118 miles primarily parallel to DPV	Imperial Irrigation District	Approved	118 mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs	24.09	Line
42	Desert Sunlight Project	6 miles north of Desert Center	First Solar	Approved	550 MW PV project on 4,144 acres of BLM land, requiring a 12 mile transmission line to the planned Red Bluff Substation	13.53	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
44	Devers-Palo Verde No. 2 Transmission Line Project	From the Midpoint Substation to Devers Substation	SCE	CPUC petition to modify request to construct CA-only portion approved by CPUC 11/2009	New 500 kV transmission line parallel to the existing Devers-Palo Verde transmission line from Midpoint Substation approximately 10 miles southeast of Blythe to the SCE Devers Substation near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to existing DPV ROW.	1.86	Line
45	District Community Education Support Complex	Church St at Polk St, Coachella	Coachella Valley Unified School District	Notice of Preparation filed 3/1/2013	The proposed project involves the demolition of the existing of District Community Education Support Complex and its reconstruction and expansion to consolidate all district administrative operations at the project site.	53.98	Point
46	Eagle Canyon Dam and Debris Basin Project	Canyon Plaza Dr and E. Palm Canyon Dr, Riverside County	Riverside County Flood Control and Water Conservation	DWR approved the project on 1/31/2013, and will have significant impacts	Construction of a zoned earth embankment dam and reservoir and its appurtenant structures for flood control use	73.35	Point
48	Eagle Mountain Pumped Storage Project	Eagle Mountain Iron Ore mine, north of Desert Center	Eagle Crest Energy	FERC draft EIS published in 12/2010	1,300 MW pumped storage project on 2,200 acres of public and private land designed to store off-peak energy to use during peak hours	19.54	Point
51	East County Detention Center	Existing Riverside County Jail, Indio	Riverside County	EIR filed, review period ends 6/4/2013	1,273 bed expansion of existing 353 bed detention center	58.15	Point
52	EIR No. 512, Specific Plan No. 376 (Thoroughbred Farm)	Bellgrave Ave and Wineville Ave, Riverside County	City of Jurupa Valley	Lead agency approved the project on 11/15/2012, and will have significant impacts	The proposed project includes approximately 42.6 acres of light industrial uses, 36.5 acres of business park uses, 11.5 acres of commercial/retail uses, and 7.6 acres of commercial/tourist uses. The project also includes approximately 10.0 acres of potential roads	135.45	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
53	EnXco	North of Wiley's Well Rd, east of Genesis Solar Project	EnXco	POD in to BLM	300 MW solar PV project	17.21	Polygon
54	Expanded Gage Exchange Project	Kansas Ave, Spruce St, Chicago Ave, Iowa Ave, Watkins Dr, Blaine St, Riverside	City of Riverside	Ca Dept of Public Health approved the project on 11/30/2012, and states that the project will not have significant impacts	The City of Riverside proposes to install approximately 12,285 feet of 18-inch ductile iron pipe and booster station that will reduce the amount of imported Colorado River water, and will enable the City to increase the supply of irrigation water.	123.79	Point
55	Fernando Child Care Center	Limonite Avenue and Wineville Avenue, Jurapa Valley	City of Jurupa Valley	Lead agency approved the project on 3/11/2013, and will not have significant impacts	Proposal to establish a day care center for up to 44 children and 5 staff on 0.51 acre parcel.	131.21	Point
56	First Inland Logistics Center II	San Michele Rd, Perris Blvd, Nandina Ave, Moreno Valley	City of Moreno Valley	Notice of preparation filed on 12/4/2012	Review Per Lead Plot Plan PA12-0023 proposes 400,130 SF warehouse building on 17.3 acres at the southwest corner of San Michele Avenue and Perris Boulevard. A 8.4 acre portion of the site is an existing truck storage facility with the northern vacant 8.9 acres currently entitled with a truck storage facility.	116.61	Point
57	Foothill Parkway Westerly Extension	Foothill Pkwy between Skyline Dr and Green River Rd, Corona	City of Corona	California Transportation Commission approved the project on 12/6/2012, and stated will have significant impacts.	The project will extend Foothill Parkway for approximately two miles by constructing a four-lane roadway with bicycle and pedestrian facilities from 600 feet west of Skyline Drive to Green River Road in the vicinity of Paseo Grande.	138.71	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
58	Four Commercial Projects	Blythe	Various	Approved	Four commercial projects have been approved by the Blythe Planning Department, including the Agate Road Boar & RV Storage, Riverway Ranch Specific Plan, Subway Restaurant and Motel, and Agate Senior Housing Development. Dates of construction are unknown at this time.	36.48	Point
59	Fred Waring Drive Improvement Project	Fred Waring Drive, between Adams Street to Port Maria Rd, Riverside	Riverside County Transportation Commission	Lead agency approved the project on 3/6/2013, and will not have significant impacts	The project will widen Fred Waring Drive from four to six lanes for a distance of .65 miles, install a bike lane on the south side of the roadway and construct a raised median with left turn lanes between Adams Street and Port Maria Road.	59.94	Point
60	General Plan Amendment No. 778, Change of Zone No. 7270, Tentative Tract Map No. 33248	S. of Indiana Avenue, E. of Lincoln Street in the Home Gardens Community of unincorporated Riverside County	County of Riverside	Mitigated negative declaration filed on 1/4/2013	The Change of Zone proposes to amend the zoning for the site from residential Agriculture- Two Acre Minimum (R-A-2) and areas with no previous zoning (previous Right of Way) to One Family Dwelling-10,000 sq. ft. Minimum (R-1-10,000), Residential Agricultural Two Acre Minimum (R-A-2) and Open Area Combining Zone Residential Developments (R-5). The Tentative Tract Map proposes a Schedule 'A' subdivision of 18 acres into 16 single family residential lots with a minimum lot size of 7200 sq. ft. and one (1) 6.73 acre lot for open space.	132.27	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
61	General Plan Update	Various locations in Calimesa	City of Calimesa	Notice of Preparation filed on 2/14/2013	The update will include the addition of new sustainability-related goals and policies, a review of existing goals and policies, and an overall streamlining of the existing General Plan	108.42	Point
62	General Plan Update	City-wide, La Quinta	City of La Quinta	Final document submitted on 12/6/2012	Update of the La Quinta General Plan to encompass all mandated Elements and add a Sustainable Community and an Economic Development Element. The Update will include modifications to the Land Use Map, but will not significantly change land use patterns in the city.	62.32	Point
63	Genesis Solar Energy Project	North of Interstate 10, 25 miles west of Blythe, 27 miles east of Desert Center	NextEra (FPL)	Approved, under construction	250 MW solar power project on 1,950 acres north of the Ford Dry Lake. 6 mile natural gas pipeline and 5.5 mile gen-tie line to the Blythe Energy Center to Julian Hinds Transmission Line	12.47	Polygon
64	Gestamp Asetym Solar	Northwest of Blythe	Gestamp Asetym Solar	EPA review	37 MW solar power plant	352.62	Point
65	Gilman Home Channel Lateral A, Stage 3 Project	Wilson Street, Williams Street, 4th Street, and 12th Street, Banning	Riverside County Flood Control and Water Conservation District	Lead agency approved the project on 2/6/2013, and will not have significant impacts	Flood control as part of the 100-year storm runoff plan	96.41	Point
66	Grading Environmental Assessment-EA42558	Northerly of Upper Valley Rd and easterly of Bautista Rd, unincorporated Riverside	County of Riverside	Mitigated negative declaration filed on 1/8/2013	EA No. 42558 is an application by Tricia Napolitano for an initial study for a grading permit (BGR120054) on APNs 573-040-001 and 573-040-002; the project is located northerly of Upper Valley Road, easterly of Bautista Road, and westerly of Polliwog Road within unincorporated Riverside CA	86.06	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
68	Grant for LCNG Fueling Facility	East Side of South Willow Street between West 14th Avenue, Blythe	Energy Commission	Lead agency approved the project on 1/9/2013, and will not have significant impacts	This grant agreement will fund a project by Blackhawk Logistics LLC to construct a publicly accessible liquefied natural-gas station to fuel goods movement trucks along the Interstate 10 connection between California and Arizona.	35.55	Point
69	Green Energy Express Transmission Line Project	Eagle Mountain Sub to So. California	Green Energy Express	Approved	70 mile double circuit 500 kV transmission line from Eagle Mt. Sub to So. California	1.88	Line
70	Green River Communication Site	82695 Doctor Carreon Blvd., Indio	US Army Corps of Engineers	Lead agency approved the project on 3/12/2013, and will have significant impacts	Relocation of an existing communication site	58.19	Point
71	Hwy 111 Beautification and Improvement Project	Hwy 111, Riverside County	California State Transportation Commission	Lead agency approved the project on 3/5/2013, and will not have significant impacts	The project will widen Highway 111 from four to six lanes for a distance of approximately four miles.	65.94	Point
72	Hwy 86 Domestic Water Transmission Main Phase 2 and Pump Station	Avenue 80 and Hwy 86, Riverside and Imperial Counties	Coachella Valley Water District	Lead agency approved the project on 11/13/2012, and will not have significant impacts	The proposed 30-inch-diameter pipeline is approximately 7.2 miles long and will connect to an existing 30-inch-diameter pipeline located on the west side of Highway 86 at Avenue 74.	52.60	Point
73	I-215/Newport Road Interchange Improvement Project	I-215 at Newport Rd, Menifee	Caltrans #8	Lead agency approved the project on 3/6/2013, and will not have significant impacts	Intersection improvements on Interstate 215 at Newport Road in the City of Menifee	113.00	Point
74	Imperial Solar Energy Center West	El Centro	CSOLAR Development	ROW granted	250 MW solar facility located on 65 acres of BLM land	73.11	Polygon
75	Imperial Wind	Black	Imperial	Authorized	48-65 MW	46.87	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
		Mountain, CA	Wind				
76	Indian Wells Tennis Garden	Washington St and Miles Ave, Indian Wells	City of Indian Wells	Lead agency approved the project on 2/21/2013, and will have significant impacts	The proposed project includes various renovations to the existing Indian Wells Tennis Garden and the expansion of tennis facilities to the east. Major components of the proposal include a second tennis stadium, signalized main entry, grassed and paved parking lots, on-site circulation and bus queuing areas, landscaped pedestrian corridors, shade canopies, new practice tennis courts, and driveway improvements.	63.00	Point
77	Intake Shell	Blythe	Shell	Under Construction	Reconstruction of a Shell facility located at Intake & Hobson Way	37.44	Point
79	Interstate 10/Jefferson St Interchange Improvement Project	Indio	Caltrans #8	Project start summer 2014, completion expected fall 2016	Hwy interchange improvements	60.63	Point
80	Interstate 10/Monterey Avenue Interchange Improvement Project	Interstate 10 at Monterey Ave near the City of Thousand Palms	Cal Trans #8	Lead agency approved the project on 3/5/2013, and will not have significant impacts	Intersection improvements on Interstate 10 at Monterey Avenue near the City of Thousand Palms	69.30	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
82	Joshua Palmer Realignment	Joshua Palmer Way and Highland Springs Ave, Banning	City of Banning	Negative declaration filed on 11/19/2012	The project is a realignment of Joshua Palmer Way to the north and west of its current location and which includes the construction of a new four-way intersection including traffic signal improvements at Highland Springs Avenue approximately 340 feet south of West Ramsey Street.	101.11	Point
83	Jurisdictional Delineation and Permits for Operations and Maintenance of Whitewater River Stormwater Channel and Coachella Valley Stormwater Channel	Various locations through Coachella Valley	Coachella Valley Water District	Lead agency approved the project on 2/21/2013, and will not have significant impacts	Operation and maintenance activities include mowing, mulching, grading, tree removal, disking, excavating, dredging, filling, armoring of banks, and water monitoring to allow the WWRSC/CVSC system to operate under optimal conditions per design.	50.63	Line
85	La Paz Solar Tower	La Paz County, AZ	EnviroMission	Pre-construction	200 MW power station on 11.000 acres	60.63	Point
88	Longview Tank and Pipelines and Watson Booster Station and Pipelines	Longview Ln and Alerich St, Perris	Eastern Municipal Water District	Lead agency approved the project on 2/11/2013, and will not have significant impacts	EMWD proposes to construct a 5.63-million-gallon water storage tank and associated 24-inch diameter underground potable water transmission pipeline and booster pump.	111.51	Point
89	March Business Center	Heacock St and Iris Ave, north of the Perris Valley Channel, Moreno Valley	City of Moreno Valley	Final document filed on 11/30/2012	Subdivision of a 75.05 acre portion of land into four separate parcels to include four individual industrial buildings totaling 1,484,407 sq. ft. within the land use district	117.59	Point
90	McCoy Solar	North of	McCoy	Record of Decision	750 megawatt (MW) photovoltaic	24.82	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
	Energy Project	Interstate 10, south of McCoy Wash, east of McCoy Mountains, Riverside County	Solar, LLC	signed on March 13, 2013	(PV) solar energy generating facility and related infrastructure in unincorporated Riverside County, CA. About 7,700 acres of BLM land and 470 acres of private land.		
91	McCoy Soleil Project	10 miles northwest of Blythe	EnXco	Plan of Development to Palm Springs BLM	300 MW solar power tower project located oAn 1,959 acres. Requires a 14-mile transmission line to proposed SCE Colorado Substation south of Interstate 10	24.96	Polygon
92	Mid County Parkway Project	Corona	Riverside County Transportation Commission	Draft EIR filed 1/24/2013	Extended review per lead the RCTC, FHWA, and Caltrans are proposing a project to improve west-east transportation in western Riverside County between Interstate 215 in the west and State Route 79 in the east. This is a 16-mile transportation corridor traffic congestion relief project.	139.62	Point
93	Milpitas Wash	Chuckwalla Valley	John Deere Renewables	Authorized	Wind Farm	19.96	Polygon
94	Moreno Valley Field Station Specific Plan	Lasselle St and Brodiaea Ave, Moreno Valley	City of Moreno Valley	CDFW approved the project on 3/11/2013, stating the project will have significant impacts	CDFW is executing a Lake or Streambed Alteration Agreement (SAA#1600-202-0173-R6 [Revision 1]) pursuant to section 1602 of the Fish and Game code to the project.	115.90	Point
95	Mount Signal Solar Farm #1	Calexico	82LV 8ME	EA pending	600 MW solar PV project located on 1,440 acres	50.84	Point
96	MSP for Pyrite Creek Trunk Sewer Phase II, Sky Country Trunk Sewer, and Force Main	Limonite Ave/Van Buren Blvd; Jurupa Rd/Van Buren Blvd; Wineville Ave/Limonite	Jurupa Community Services District	Mitigated negative declaration filed 2/7/2013	Replace existing sewer pipelines and install additional sewer lines and components as the need and demand arises in the District's service area	131.62	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
	to Riverside WWTP	Ave, Jurapa Valley					
99	Murrieta Creek Phase 2	Murrieta, Temecula, Wildomar, Riverside County	US Army Corps of Engineers	Supplemental EIR filed 12/4/2012	The U.S. Army Corps of Engineers (Corps) proposes to construct various improvements to provide flood control, a multi-purpose trail, and higher quality riparian habitat along the existing Murrieta Creek Channel within the location described below.	113.90	Point
100	Music Festival Plan	Monroe Street/49th Ave; Monroe/52nd Ave; Madison/50th Ave; Madison/52nd Ave, Indio	City of Indio	Approved by lead agency on 4/17/2013	The Major Music Festival Event Permit allows the applicant to hold Major Music Festival events on up to five weekends annually from 2014-2030 on a 601-acre site. The maximum daily attendance allowed is 75,000 persons for two of the permitted events and 99,000 for the other 3 events.	59.54	Point
103	Non-Potable Water Service Expansion in the Eastern Portion of the District (DPR 3657DP)	Limonite Ave/EI Palomino Dr; Clay St/Van Buren Blvd; Mission Blvd/Pyrite St & Camino Rd, Jurapa Valley, Riverside	Jurapa Community Services District	Mitigated negative declaration filed 1/29/2013	New non-potable pipelines; reuse of an existing three million gallon (MG) water reservoir; and new pump stations. There are eight reaches of potential non-potable pipelines. One reach of non-potable pipeline includes the reuse of an existing three MG water reservoir. Two reaches include the potential for a new pump station.	130.69	Point
104	North City Extended Specific Plan	N. of Interstate 10 along the Varner Road Corridor, Cathedral City	Cathedral City	Notice of Preparation filed 1/28/2013	The North City Extended Specific Plan is a proposal to develop 568 acres of land featuring an estimated 235.94 acres of land.	72.81	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
105	Oak Creek Canyon Residential Project	Bundy Canyon Rd between Oak Canyon Dr and Sunset Ave, Wildomar	City of Wildomar	Project approved on 2/25/2013	A proposed subdivision of 151.23 acres into 315 lots (including a 3.5 acre commercial site - Lot L) for the development of 315 single family residential dwelling units with lot sizes ranging from 4,000 sq. ft. to 7,200 sq. ft. with private parks	118.15	Point
106	Ocotillo Sol	9 miles southwest of El Centro	SDG&E	NOI published	18 MW PV project on 115 acres	73.57	Polygon
107	Ocotillo Wind Energy Facility	5 miles west of Ocotillo	Ocotillo Express	ROW approved	115 MW wind facility located on 12,436 acres of BLM land	80.09	Polygon
108	Ogilby Solar	Chocolate Mountain	Pacific Solar Investments	Revised POD 8/26/11	1,500 MW Solar Thermal Trough	53.37	Polygon
109	Operation of New Well #17	Yucaipa	City of Yucaipa	Notice of Determination filed 1/29/2013	The South Mesa Water Company proposed project included construction of Well No. 17, a chlorination system, a housing unit, appurtenant structures, and chain link fence.	107.89	Point
110	Optimus Logistics Center	Ramona Expressway and Webster Ave, Perris	City of Perris	Notice of preparation filed on 11/1/2012	The proposed project consist of a new high-cube warehouse development consisting of two buildings totaling 1.5 million square feet on two individual parcels totaling 73.76 acres separated by the new Patterson Avenue realignment.	117.61	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
112	PA08-0097 (Plot Plan), PA08-0098 (Zone Change), PA09-0022 (TPM 36207, & PA10-0017 (Code Amendment)	Fir/Eucalyptus Ave, Redlands Blvd, Moreno Valley	City of Moreno Valley	CDFW approved the project on 1/9/2013, stating the project will not have significant impacts	Streambed Alteration Agreement consisting of the construction of one 937,260 square-foot warehouse distribution facility, with associated on-site parking, landscape, hardscape, screening, infrastructure improvements, and the construction of adjacent roadways.	114.24	Point
113	Palo Verde Mesa Solar Project	N/W Of Blythe	Renewable Resources Group	NOP Filed	486 MW Solar	29.26	Polygon
114	Pelican 33-Acre Industrial Project	Markham St. and Redlands Ave, Perris	City of Perris	Notice of Preparation filed 3/6/2013	The proposed Pelican 33-acre Industrial Project involves the construction and operation of up to 600,000 gsf of light industrial warehouse uses.	115.75	Point
115	Perris Middle School and Central Kitchen	Perris	Perris Union High School District	NOP filed, waiting for mitigated negative declaration to be filed	Construction and operation of a 95,000 sq. ft. middle school	115.19	Point
116	Pyrite Channel Bypass	Galena St and Pyrite St, Jurupa Valley	Riverside County Flood Control and Water Conservation	Lead agency approved the project on 11/30/2012, and will not have significant impacts	The proposed storm drain project consists of approximately 1700 lineal feet of reinforced concrete pipe that will convey minor flows from the District's existing concrete-lined rectangular Jurupa Channel. Street improvements along Pyrite Street between Jurupa Road and Lone Trail will ensure that the storm drain system functions properly.	131.14	Point
117	Quartzsite Solar Energy	10 miles north of Quartzsite	Solar Reserve	Draft EIS released	100MW, 653 foot tall power tower located on 1,500 acres of BLM land	57.14	Polygon

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
119	Ramona 49	Bridge Rd and Ramona Blvd, San Jacinto	City of San Jacinto	Lead agency approved the project on 2/11/2013, and will not have significant impacts	Second reading of Ordinance No. 12-13 for Change of Zone 1-11, adopting a zone change from the Residential Medium Density (RM) and Specific Plan (SP Getaway) Zoning Districts to the General Commercial (CG), Industrial Light (IL), Open Space (OSR), and Residential Medium High (RMH) Zoning Districts	107.34	Point
120	Ramona Creek Specific Plan (SP-12-001)	Florida Ave and Myers St, Hemet	City of Hemet	Notice of Preparation filed 2/22/2013	The project is a specific plan to allow for development of the project site with a multiple-use commercial and residential community concentrated around open space amenities.	104.43	Point
122	Recycled Water Ponds Expansion and Optimization Project	Trumble Rd, Case Rd, Simpson Rd, Riverside	Eastern Municipal Water District	Lead agency approved the project on 3/20/2013, and will have significant impacts	EMWD is planning on the construction, operation, and maintenance of additional recycled water storage facilities at its North Trumble Recycled Water Storage Ponds site.	111.50	Point
123	Recycled Water Program	River Road and the Santa Ana River	Western Riverside County Regional Wastewater Authority	Lead agency approved the project on 11/14/2012, and will have significant impacts	WRCRWA intends to provide recycled water to its member agencies for non-potable uses in accordance with the terms of its Resolution No. 97-38. The agencies utilizing the recycled water would provide for the ultimate use under their individual permits.	116.90	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
124	Rice Solar Energy Project	Rice Valley, Eastern Riverside County	Rice Solar Energy	Approved, construction date unknown at this time	150 MW solar power tower project with liquid salt storage. Project located on 1,410 acres and includes a power tower approximately 650 feet tall and 10 miles long and interconnection with the WAPA Parker-Blythe transmission line	34.55	Polygon
126	Riverside County Regional Medical Center, Nursing and Allied Health Education Building Project	South of State Road 60 and East of I-215, at 26520 Cactus Avenue, Moreno Valley	Riverside County Economic Development Agency	Lead agency approved the project on 3/19/2013, and will not have significant impacts	Nursing and Allied Health Education Building (Education Building) as a three-story structure with approximately 34,749 square feet	115.13	Point
127	RPT Centerpoint West Project	Frederick St and Cactus Ave, Moreno Valley	City of Moreno Valley	Final document filed on 11/16/2012	The proposed project consists of construction and operation of a warehouse facility with two individual warehouses of varying sizes and an expansion of an existing warehouse for a total of 1,281,000 sq. ft. on 56.2 acres.	118.83	Point
128	San Geronio Pass Campus Master Plan	Westward Ave and Sunset Ave, Banning	Mt. San Jacinto Community College District	Draft EIR filed 1/22/2013	Buildings on the Campus are planned to total of 250,000 gross sq. ft. of laboratory, lecture, and other space including physical fitness facilities, library, and miscellaneous administrative office and support space. The total parking provided would be 2,203 spaces.	99.30	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
129	San Jacinto Master Drainage Plan Line C	Santa Fe St and Midway St, San Jacinto	Riverside County Flood Control and Water Conservation	Project approved on 4/4/2013, will not have significant impacts	The project will construct, operate, and maintain Line C, Line C-5, C-4, and Line B underground storm drain facilities pursuant to the District's adopted San Jacinto Master Drainage Plan. The project includes relocation of existing utilities, repaving disturbed areas, and purchasing permanent and temporary construction easements on multiple properties.	100.96	Point
130	San Jacinto Valley Master Drainage Plan and Amendment	San Jac. Riv to the N. Meridian St to the E, Florida Ave to the S, & Warren Rd to the W., San Jacinto	City of San Jacinto	Lead agency approved the project on 1/14/2013, and will have significant impacts	The project consists of the revision and consolidation of two existing and previously adopted Master Drainage Plans located in portions of the Cities of San Jacinto and Hemet and unincorporated Riverside County, California.	98.96	Point
131	San Joaquin Rail Corridor 2035 Vision Project	Several counties within the San Joaquin Valley	Caltrans #7	Notice of Preparation filed on 11/13/2012	The proposed San Joaquin Rail Corridor (Corridor) Project infrastructure upgrades would generally be installed within the existing track rights-of-way, with limited rights-of-way acquisition if any, and would not change the existing land use of the rail corridor or the surrounding parcels.	176.58	Line
132	Santa Ana River Bridge Seismic Retrofit	Near the intersection Wilderness and Jurupa Ave, east of Van Buren Ave, Riverside	Metropolitan Water District of Southern California	Lead agency approved the project on 3/12/2013, and will not have significant impacts	The project proposes to provide seismic retrofit upgrades to the Santa Ana River bridge crossing to accommodate lateral displacement in the transverse direction of the bridge.	130.02	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
133	SCE Red Bluff Substation	South of Interstate 10 at Desert Center	SCE	Approved	A proposed new 500/220 kV substation, 2 new parallel 500 kV transmission lines of about 2,500 to 3,500 feet each	5.80	Polygon
134	Sierra Bella Specific Plan/Annexation	Green River Rd beyond Calle Del Oro, Corona	City of Corona	Addendum to Specific Plan filed on 3/20/2013	Application to amend the Sierra Bella Specific Plan (SP04-001) by reducing the minimum lot size requirement for the LDR 1 (Low Density Residential, minimum lot size, 9,000 sq. ft.) and LDR 2 (Low Density Residential, minimum lot size, 14,000 sq. ft.) designation to 7,200 sq. ft. and 9,000 sq. ft., respectively.	139.23	Point
136	Sol Orchard	Desert Center	Sol Orchard	Approved	A planned 1.5 MW fixed flat-panel PV solar power plant north of Interstate10, east of State Route 177, west of Desert Center Airport	107.01	Polygon
137	Starwood Solar 1	75 miles west of Phoenix	Lockheed Martin	Under Construction	290 MW concentrated solar power plant	119.10	Point
138	State Route 60/Potrero Boulevard New Interchange	Potrero Blvd, Beaumont	Cal Trans #8	Lead agency approved the project on 3/1/2013, and will not have significant impacts	The proposed State Route 60/Potrero Blvd. New Interchange project features construction of a new full access interchange and bridge overcrossing on State Route 60 for Potrero Blvd.	101.01	Point
139	State Route 79 Realignment Project	Domenigoni Pkwy, Hemet to Gilman Springs Rd, San Jacinto	Cal Trans #8	Draft EIR Submitted 2/8/2013	The realigned highway would be a limited access, four-lane expressway, with two travel lanes in each direction separated by a median. The alternatives evaluated in the DEIR are four build alternatives, two design options, and	103.30	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
					a no-build alternative.		
140	State Route 91 Corridor Improvement Project	State Routes 91 and I-15, Anaheim, Corona, Riverside	Caltrans #8	Riverside County Transportation Commission approved the project on 11/14/2012, and will have significant impacts	The State Route 91 CIP proposes capacity, operational, and safety improvements on State Route 91 and Interstate 15.	135.30	Point
141	Stratford Ranch Industrial Project	Redlands Ave and Perry St, Perris	City of Perris	Lead agency approved the project on 11/17/2012, and will have significant impacts	Development of a high-cube logistics warehouse site in two buildings totaling up to 1,725,411 square feet. Infrastructure improvements including 2.4 acres for dedication and construction of Redlands Avenue street frontage improvements. Improvements to the Perris Valley Storm Drain (PVSD) channel encompassing 45.7 net acres	115.95	Point
142	Temescal Canyon and Dawson Canyon Pipelines and Non-Potable Water Tank Project	Temescal Cyn Rd and Dawson Cyn Rd, Corona	Lee Lake Water District	Mitigated negative declaration filed on 12/19/2012	The LLWD proposes construction of a Non-Potable Water System, which includes the Temescal Canyon Pipeline, the Dawson Canyon Pipeline, and a 1.5 MG non-potable water tank in unincorporated Riverside County, CA.	131.20	Point
143	Tentative Tract Numbers 30386 and 30387	California St, Bryant St, and Fremont St, Calimesa	City of Calimesa	Project approved by CDFW on 4/10/2013, will not have significant impacts	Construction of an approximate 210-unit senior housing subdivision on 72.23 acres, of which 23.9 acres will remain open space.	107.11	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
144	The Triangle Specific Plan (SP0-007-2452)	I-15, I-215, Murrieta Hot Springs Rd, Murrieta	City of Murrieta	Draft EIR Submitted 2/8/2013	The Triangle Specific Plan Project involves implementation of a mixed-use development consisting of approximately 1.77 million gsf within an open-air retail commercial district. Proposed uses include restaurant (125,258 gsf), commercial/retail (640,914 gsf), theater (74,660 gsf), office (779,082 gsf), and 220-room hotel (148,000 gsf).	113.16	Point
145	Three Residential Developments	Blythe	Various	Under Construction	Three residential development projects are under construction: River Estates at Hidden Beaches; The Chanslor Place, and Mesa Bluffs; 125 single-family homes are currently being built.	35.53	Point
146	Trails of Eastvale Residential Development	Archibald Ave and 65th St, Eastvale	City of Eastvale	Mitigated negative declaration filed 2/4/2013	The proposed project consists of a General Plan Amendment from Light Industrial to Medium Density Residential, a Change of Zone from A-2-10 to PRD, and a Tentative Tract Map to subdivide a 50.48-acre site into 224 single family residential lots and 13.69-acres of parkland and open space.	138.34	Point
147	Travertine Point Specific Plan	St. Rte 86, between 81st Ave and Coolidge Spring Rd, Riverside and Imperial County	County of Riverside	Lead agency approved the project on 1/15/2013, and will have significant impacts	The project proposes the construction of a total of 16,665 residential units and 5,029,500 square feet of non-residential development. This includes approximately 1,410 acres of TMDCI lands, of which 647 acres are in Imperial County.	52.10	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
148	Trumble Road Recycle Water Storage Expansion Project	Trumble Rd and Case Rd, Perris	Eastern Municipal Water District	Final document submitted 3/26/2013. Currently in comment period	EMWD is planning on the construction, operation, and maintenance of additional recycled water storage facilities at its North Trumble Recycled Water Storage Ponds site.	114.20	Point
149	Twelve Residential Developments	Blythe	Various	Approved or under construction	Twelve residential development projects have been approved by the Blythe Planning Department: Vista Palo Verde; Van Weelden; Sonora South; Ranchette Estates; Irvine Assets; Chanslor Village; St. Joseph's Investments; Edgewater Lane; The Chanslor Place Phase I; Cottonwood Meadows; and Palo Verde Oasis. A total of 1,005 single-family residences are proposed.	36.18	Point
150	Upper Valle de Los Caballos Recharge Basins	Temecula	Rancho California Water District	Lead agency approved the project on 3/14/2013, and will not have significant impacts	The project consists of infrastructure improvements to RCWD's existing Upper Valle de Los Caballos Recharge Basins.	106.10	Point
151	Van Buren Commercial Center Project Site	Van Buren Blvd and Gamble Ave, Riverside	City of Riverside	Mitigated negative declaration filed on 11/20/2012	Mass grading on 4.55 acres located at the southeast corner of Van Buren Blvd. and Gamble Ave. in the Woodcrest neighborhood, City of Riverside	123.87	Point
152	Van Horn Youth Treatment & Education Center	County Farm Road and Harrison Street, Riverside	Riverside County Redevelopment Agency	Lead agency approved the project on 3/12/2013, and will not have significant impacts	The proposed treatment and education center will be approximately 75,000 sq. ft. and comprised of a 10-bed assessment unit, a 20-bed transitional housing component, and four 20 single-cell living units (with the potential for a future 20-bed transitional housing component and a 20 single-cell living unit with recreation areas for an additional 11,692 sq. ft.	129.91	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
153	Waite Street 1467 Zone Reservoir and Pipeline	Pointe Circle & Waite Street, Wildomar	Elsinore Valley Municipal Water District	Mitigated Negative Declaration filed 3/4/2013	The proposed Waite Street 1467 Zone Reservoir and Pipeline Project is located within the City of Wildomar in Riverside County.	118.83	Point
154	Wake Rider Beach Resort	Grand Ave between Macy St and Serena, Lake Elsinore	City of Lake Elsinore	Mitigated negative declaration filed 12/13/2012	A commercial mixed-use project, which consists of five buildings totaling 62,437 square feet, with associated on-site and off-site improvements, including hardscape and landscaping	124.89	Point
155	Water Reclamation Facility #2- Tertiary Filtration Project	E. Harrison St and Le Roy Dr, Corona	City of Corona	Addendum Note: Review Per Lead An EIR for the Groundwater Management Plan was adopted by the City Council of the City of Corona in 2012. The GWMP identified eight categories of management strategies and defined 25 specific management strategies for implementation of the GWMP, which are intended to facilitate a sustainable groundwater resource supply for the City. The PEIR (incorporated herein by this reference) analyzed the environmental impacts of the GWMP and imposed mitigation measures set forth in a Mitigation Monitoring and Reporting Program	The city wishes to ensure a long-term sustainable supply of groundwater resources and has therefore proposed its AB 3030-compliant Groundwater Management Plan (GWMP).	135.52	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
156	Well Number 31 for Temescal Desalter	Buena Vista Avenue and Sixth Street, Corona	City of Corona	Project approved on 3/22/2013, and will not have significant impacts	Domestic water supply well (Well 31) to serve the city's potable water system. Well 31 will connect to the existing Temescal Desalter Well Collection Pipeline.	136.74	Point
157	Wenzlaff Elementary School Conversion	11625 West Drive, Desert Hot Springs	Palm Springs Unified School District	Review period ended 5/13/2013. No updates as of 5/17/2013	The existing buildings would be renovated and modernized to accommodate the new programs and students. Project and possibly an area for future ground-mounted solar panel integration. Other site improvements would include mechanical, electrical, and plumbing equipment and facility upgrades.	77.15	Point
159	Wildomar 2014-2021 Housing Element Update and EIR	Wildomar	City of Wildomar	NOP for EIR filed, with review period ending 6/3/2013	Land use change and re-zoning of 25.96 acres of residential and business land	118.51	Point
160	Wileys Well Communication Tower	East of Wiley's Well Road just south of Interstate 10	Riverside County	Final EIR	Expansion of Riverside County's fire and law enforcement agencies; approximately 20 communication sites to provide voice and data transmission	18.86	Point
161	Wine County Infrastructure Sewer Project	Monte De Oro Road, Rancho California Road and Calle Contento Road, Temecula	Eastern Municipal Water District	Lead agency approved the project on 12/19/2012, and will not have significant impacts	45,200 lineal feet of sewer lines and two lift stations. The Wine Country Infrastructure Project would connect into EMWD's existing wastewater collection system on Butterfield Stage Road adjacent to the Roripaugh Ranch Development	108.92	Point

OID	Project Name	Location	Ownership	Status	Project Description	Distance (mile)	Feature
162	World Logistics Center Project	Redlands BLVD and Eucalyptus Ave, Moreno Valley	City of Moreno Valley	Draft EIR submitted 2/5/2013	The proposed World Logistics Center project (WLC) site covers 3,918 acres in eastern Moreno Valley. A General Plan Amendment is proposed to designate 2,635 acres for logistics warehousing including up to a maximum of 41.4 million sq. ft. of "Logistics Development" and 200,000 sq. ft. of warehousing-related uses classified as "Light Logistics."	113.14	Point
163	WR-34 Hydroelectric Power Generation Facility	Pujol Street, Temecula	Rancho California Water District	Construction expected to begin 8/15/2013, and expected to last 6 months	Construction of a hydroelectric power generation facility at the existing WR-34 Turnout Facility.	112.48	Point
164	Wyle Laboratories Inc-Norco Facility	Hillside Ave and Second St, Norco	Department of Toxic Substances Control	Negative declaration filed on 11/27/2012	DTSC is considering approval of a Draft Remedial Action Plan (RAP) to address volatile organic compounds (VOCs) in subsurface soil and groundwater at the former Wyle Laboratories site in Norco, CA.	135.02	Point
165	Yuma Crude Oil Refinery	100 miles SW of Phoenix and 48 miles E of Yuma	Arizona Clean Fuels Yuma	Under review	Oil refinery on 1,400 acres	105.79	Point
166	Sol Orchard	Desert Center	Sol Orchard	Approved	A planned 1.5-MW fixed, flat-panel solar PV project north of Interstate 10, east of State Route 177, west of Desert Center Airport	107.01	Point

**Project Description – Table 4  
Projects Submitted and On Hold**

OID	Project Name	Location	Ownership	Status	Project Description	Distance (Mile)	Feature
67	Graham Pass Wind Project	Riverside County	Graham Pass Inc	Pending	175 MW Wind Project	14.60	Polygon
86	La Posa Solar Thermal	Stone Cabin, AZ	Pacific Solar Investments	Pending	2,000 MW Solar	60.04	Polygon
87	LH Renewables Riverside County Type II	Eagle Mountain, CA	LH Renewables	Pending	Unknown	17.71	Polygon
97	Mule Mountain III	Chuckwalla Valley	EnXco	Pending	200 MW Solar PV	22.04	Polygon
102	Nextlight Quartzsite	Quartzsite, AZ	Nextlight Renewable Power	Pending	50 MW CSP Trough	57.91	Polygon
111	Oro Valley Wind	Black Mountain, CA	Oro Valley Power	Pending	180 MW Wind Project	47.58	Polygon
135	Silverado Power I, II, III	West of State Route 177, North of Interstate 10	Silverado Power	On hold	3 solar PV projects with a 400 MW total capacity.	342.12	Point
158	Wildcat Quartzsite	Quartzsite, AZ	Wildcat Quartzsite Solar	Pending	800 MW CSP Tower	62.34	Polygon

(Ex. 2000, pp. 1-23 – 1-54).

## **NON-OPERATION AND FACILITY CLOSURE**

PSEGS will be designed for an operating life of 25 to 30 years. Non-operation is time-limited and can encompass part or all of a facility. Non-operation can be a planned event, usually for minor equipment maintenance or repair, or unplanned (usually the result of unanticipated events or emergencies). (Exs. 1003, p. 3.1-5; 2000, p. 3-11.)

Closure is a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to re-start over an increasingly lengthy period of non-operation, condemned by inadequate means and/or lack of a viable plan. Facility closures can occur due to a variety of factors including, but not limited to, irreparable damage and/or functional or economic obsolescence. Please see the **GENERAL CONDITIONS** section of this Decision for specific non-operational and closure requirements. (Ex. 2000, p. 3-12.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project would be beneficial to the public, Petitioner, or Interveners. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Throughout this Decision, we describe various benefits that would accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. The PSEGS site is designated “Developable” in the BLM’s Eastern Riverside County Solar Energy Zone. In addition, as described in this Decision, power tower technology eliminates the use of millions of gallons of flammable Therminol, the Heat Transfer Fluid (HTF) utilized by the parabolic trough technology. The PSEGS would reduce the original PSPP footprint to further avoid environmental impacts. Each Unit has an approved PPA and PSH has a Large Generator Interconnect Agreement (LGIA) for 500 MW of interconnection rights that allows it to safely deliver the electrical output of the PSEGS to the Southern California Edison (SCE) Red Bluff Substation. The use of a fully-permitted site (as reconfigured), with an approved LGIA on the BLM land designated for solar development, is a responsible approach to helping California achieve its Renewable Portfolio Standards and beyond. PSEGS provides the following environmental benefits:

- Reduces 572 acres of impacts to Desert Tortoise habitat;
- Reduces impacts to Mojave Fringe Toed Lizard habitat;
- Reduces operational water use from 300 AFY to 201 AFY;
- Reduces construction water use from 5,750 acre feet to 1,130 acre feet;
- Reduces grading from a total of 4.5 million cubic yards of cut and fill to 0.2 million cubic yards of cut and fill;
- Reduces grading across the solar field, thereby reducing direct and indirect impacts to washes; and
- Reduces impacts by eliminating the relocation of existing SCE 161 kV. transmission line. (Exs. 1003, pp. 1-2 – 1-3.)

The 250 MW Reduced Acreage Alternative would still help California achieve its Renewable Portfolio Standard goals, and it would reduce the overall project footprint to approximately 1,960 acres with corresponding lesser impacts.

### **CHANGED INFORMATION OR CIRCUMSTANCES**

The Applicant, in the Amendment Petition, explained the change in information and circumstances as follows:

On April 2, 2012, PSI, along with other Solar Millennium US-based companies, petitioned for relief in federal bankruptcy court. On June 21, 2012, the bankruptcy court approved the transfer of the project to BrightSource. The Commission subsequently approved a petition to amend the Final Decision to transfer ownership of the project to Palen SEGS I, LLC, a wholly-owned, indirect subsidiary of BrightSource (Order No. 12-0711-3). After approval of the ownership transfer of the Final Decision to Palen SEGS I, LLC, BrightSource Energy, LLC and Abengoa formed a joint venture to develop the site using BrightSource's solar power- tower technology. The joint venture company is Palen Solar Holdings (PSH). This Petition describes the ultimate ownership as follows: PSH is the parent company of Palen SEGS I, LLC and Palen SEGS II, LLC. Palen SEGS I, LLC will own and operate Unit 1, Palen SEGS II, LLC will own and operate Unit 2, and both entities will share ownership of common facilities and the generation tie-line. (Ex. 1003, p. 1-2.)

PSH acquired the PSEGS site in order to develop BrightSource's proprietary solar thermal tower technology on the site. This change in technology could not have been anticipated during the original permitting process because at the time of the original licensing, PSI was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision. (Ex. 1003, p. 1-2.)

## **PUBLIC COMMENT**

**Pat Flanagan**, on behalf of the Morongo Basin Conservation Association, offered comments on December 6, 2013, and December 12, 2013, regarding some confusion regarding the true tower heights contained in the project description. As explained above, each of the two solar power tower structures is approximately 620 feet tall. The SRSG located at the top of the solar power tower is approximately 130 feet tall, resulting in an overall combined tower height of approximately 750 feet.

**Teresa Regina Weiner** made a similar comment on July 31, 2014.

**Arlene Kingery** commented at the July 30, 2014 evidentiary hearing that she understood from discussions between Petitioner's counsel and an expert witness at a workshop that thermal energy storage would require more gas and more heliostats. These comments are addressed above in this section.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. Petitioner, Palen Solar Holdings, a joint venture of BrightSource Energy, LLC and Abengoa, will own and operate the PSEGS project;
2. SEGS is located approximately ¼ mile north of I-10, approximately 10 miles east of Desert Center and approximately halfway between the Cities of Indio and Blythe, in Riverside County, California;
3. Although we have certified the Reduced Acreage Alternative, which consists of only the first phase of the PSEGS project, it is foreseeable that the project owner or another applicant could apply for certification of a project similar to the proposed second phase of the PSEGS;
4. It is beneficial to the public and potential future applicants to be apprised of the environmental impacts and mitigation analysis of both phases of the whole of the project even though we are only certifying the first phase;
5. The Reduced Acreage Alternative would have a nominal capacity rating of 250 MW;
6. The Reduced Acreage Alternative is expected to take about 28 months for construction and startup testing;
7. The construction period for the Reduced Acreage Alternative would have an average workforce of 603 and a peak workforce of 1,241 workers on site;
8. The facility would operate at its maximum continuous output for as many hours per year as solar input allows, or as limited by contractual terms and conditions;

9. The Reduced Acreage Alternative would use up to 204 AFY during construction and up to 101 AFY during operation;
10. Access to the site would remain the same as the PSPP with an access road from Corn Springs Road;
11. The interconnection to the regional transmission grid at SCE's Red Bluff Substation, which is currently under construction, would remain the same as the PSPP;
12. SoCal Gas would supply natural gas for PSEGS via a new 8-inch, 2,956-foot pipeline that would extend southward from the site and interconnect with an existing SoCal Gas transmission pipeline located just south of I-10;
13. The project would use raw groundwater drawn daily from on-site wells located in each power block and in the common area adjacent to the administration building;
14. The revised phasing plan for the PSEGS would not alter the analysis of the project in any significant way;
14. PSEGS would be designed for an operating life of 25 to 30 years; and
15. The project and its objectives are adequately described by the relevant documents contained in the record.

## **CONCLUSIONS OF LAW**

1. PSEGS is described at a level of detail sufficient to allow review in compliance with the provisions of both the Warren-Alquist Act and the California Environmental Quality Act.
2. The amended project would be beneficial to the public, Applicant, and Intervenor by providing additional local generating capacity, construction and operations employment, tax revenues and reduced environmental impacts compared to the approved project.
3. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process because, at the time of the original licensing, the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's final Decision on the PSPP.

## II. PROJECT ALTERNATIVES

### DESCRIPTION OF MODIFICATIONS

The proposed project amendment, Palen Solar Electric Generating System (PSEGS), would occupy the same location as the certified project, Palen Solar Power Plant (PSPP), but significant features of the PSPP would be modified to accommodate use of a different solar generating technology. The project footprint would be reduced from approximately 4,366 acres to approximately 3,794 acres. The PSEGS would eliminate the use of solar trough technology and replace it with BrightSource's solar tower technology. The BrightSource technology uses heliostats (elevated mirrors guided by a tracking system mounted on a pylon) to focus the sun's rays on a solar receiver steam generator (SRSG) located atop a solar tower near the center of each solar field to create steam. Like the PSPP, the PSEGS mirror-fields would be relatively low in height (under 20 feet maximum height). However, the amended PSEGS project would include two 750-foot-tall solar towers with 130-foot-tall solar receivers (SRSGs) at the top of the towers, which would be the focal point of the concentrated sunlight reflected by the heliostats. The SRSGs absorb the concentrated sunlight to create steam, but also reflect sunlight outwardly. The super-heated SRSGs would act as extremely bright sources of light which would be visible from vantage points beyond a 15 mile radius from the towers. Reflected light from the PSEGS would significantly affect visual and cultural resources. (Ex. 1003, p. 4.12-4.)

Access to the site would be the same as the PSPP and the PSEGS would continue to interconnect to the regional transmission grid at SCE's Red Bluff Substation. PSEGS would be comprised of the two SRSG towers, adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW. The two towers and heliostat fields would share common facilities, including a common area containing an administration building, warehouse, evaporation ponds, maintenance complex and a meter/valve station for incoming natural gas service to the site, an on-site switchyard, and a single-circuit 230 kV generation tie-line to deliver power to the electricity grid. Other on-site facilities would include access and maintenance roads (either dirt, gravel or paved), perimeter fencing, tortoise fencing, and other ancillary security facilities. (Ex. 1003, p. 2-5.)

The PSEGS would eliminate the storage and use, transportation, and on-site storage of liquid petroleum gas (LPG) and the use, transportation and storage of millions of gallons of Therminol (the heat transfer fluid (HTF) utilized by the PSPP trough technology). LPG would be replaced by the use of natural gas delivered to the site via underground pipeline. Since the use of Therminol has been eliminated, the PSEGS would no longer

require Land Treatment Units to handle and contain soil contaminated by spills or leaks of Therminol. (Ex. 1003, p. 4.3-1.)

The PSEGS would be situated entirely on land owned and operated by the Bureau of Land Management (BLM). During construction, portions of the PSEGS site would be graded, including portions along the ephemeral washes. PSEGS would reduce grading from a total of 4.5 million cubic yards of cut and fill to 0.2 million cubic yards of cut and fill. As such, the drainages would remain intact, to the extent feasible, and natural drainage waters would be expected to continue to flow in and through these ephemeral washes. Any grading required would be designed to maintain existing drainage pathways where possible. Approximately 27 percent of the site would be completely developed and the rest of the site would be left largely intact. (Ex. 2000, p. 4.2-21; Ex. 1003, p. 2-6.)

The evaporation ponds would be reduced from four 4-acre ponds to two 2-acre ponds. The PSEGS project would include a minor re-routing of the generation tie-line near the western end of the route and at the tie-in location to the Red Bluff Substation. The secondary access road has been eliminated and replaced with a secondary access gate and the redundant telecommunication line has been re-routed to be buried along the generation tie-line route. (Ex. 1003, p. 3.1-2; Ex. 2000, p. 5.1-2.)

The PSEGS project would reduce construction water consumption by approximately 80 percent from 5,750 acre feet to 1,130 acre feet over 33 months. Operational water use would decrease by one-third from 300 acre feet per year (AFY) to 201 AFY. PSEGS would construct diversion channels to bypass storm water runoff only around power blocks and common facilities areas instead of the three large drainage control channels to redirect all off-site storm water runoff around the solar fields as originally designed for the PSPP. (Ex. 2000, p. 4.9-6.)

The PSEGS would require a slight re-routing of the generation tie-line near the western end of the route around the new Red Bluff Substation. The realignment would not significantly affect the levels of transmission line impacts from the PSEGS as compared to the PSPP. (Ex. 2000, p. 4.11-4.)

The PSEGS project has a Power Purchase Agreement (PPA) and a Large Generator Interconnection Agreement (LGIA), both of which are specific to the power tower technology. (Ex. 1124.) The commercial operation date for the PSEGS PPA is July 2017. (Ex. 1151.) Later in the proceeding, it became apparent that only one PPA (for the output of a single power tower) is likely viable. (Ex. 1151, pp.7, 33; Ex. 1166, p. 4.)

Finally, evidence indicates that it may be feasible to add thermal energy storage to the PSEGS once it is constructed, and that due to the nature of power tower technology, the thermal energy storage performance would be more efficient and cost-effective than

if coupled with trough or PV technologies, as well as offer the ability to shift generation into periods of higher demand. (7/30/14 RT 50:12-18, 167:3-172:19, 208:5-23; Ex. 1143.)

We have found that the PSEGS project would have unmitigated significant impacts to cultural resources, biological resources, and visual resources. These impacts result from the visual intrusion on the Chuckwalla Valley by the 750-foot-high luminescent towers and the solar flux field caused by the reflected solar energy near the SRSG (see the **CULTURAL RESOURCES, BIOLOGICAL RESOURCES,** and **VISUAL RESOURCES** sections of this Decision).

The following exhibits on Alternatives were received into evidence on October 29, 2013: Exhibits 1003, 1077, 2000, 2002, 2003, 3000, 3001, 3036, and 3051. (10/29/13 RT 84:8 – 85:18.) The following exhibits on Alternatives were received into evidence on July 30, 2014: Exhibits 1124, 1150, 1151, 1179, 2030, 2031, and 3091. (7/30/14 RT 140:20 – 143:25.)

## **THE CERTIFIED PROJECT'S ALTERNATIVES ANALYSIS**

The alternatives analysis for the PSPP contained an evaluation of three reconfigured alternatives, a reduced acreage alternative, and one off-site alternative for detailed analysis and comparison to the PSPP. Of the three reconfigured alternatives, the Commission Decision for the PSPP determined that reconfigured **Alternatives #2** and **#3** would reduce impacts on the Mojave Fringe-toed Lizard, sand dune habitat, and the sand transport corridor. The Commission Decision approved construction and operation of either reconfigured **Alternatives #2** or **#3** using the parabolic trough technology proposed for the PSPP. No alternatives using other solar technologies were retained for detailed analysis in the previous alternatives analysis. (Ex. 2000, p. 6.1-1.)

The final Energy Commission Decision certifying the PSPP found that the reconfigured **Alternatives #2** and **#3** feasibly met the project objectives and reduced significant potential environmental impacts. Therefore, as requested by the Applicant, the Decision approved reconfigured **Alternatives #2** and **#3**. The Decision found that none of the other site location alternatives to the project offered a superior alternative as analyzed under both National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The alternative technologies analyzed by Staff could not achieve most of the project objectives. Rooftop solar photovoltaic (PV) facilities were found to require extensive acreage and the Decision found that increased deployment of rooftop solar PV at the time faced challenges in manufacturing capacity, cost, and timeliness. The Decision found that implementation of PV, whether on a utility scale or as local distributed generation, should complement, rather than substitute for, projects such as PSPP. Other generation technologies (wind, geothermal, biomass, tidal wave, natural

gas, and nuclear) were also examined as possible alternatives to the PSPP project. However, the Decision found these technologies would either be infeasible at the scale of the PSPP project, would not eliminate significant impacts caused by the PSPP project without creating their own significant impacts in other locations, or would not meet the project objectives. Further, the Decision found that conservation and demand side management programs would not meet the state's growing electricity needs that could be served by the PSPP project, and these programs would not provide the renewable energy required to meet the California Renewable Portfolio Standard (RPS) requirements. The Decision made a finding that meeting the state's obligations to develop renewable energy would require contributions from all of the commercially available renewable technologies analyzed by Staff, such that these technologies should be viewed as complementary strategies rather than as competing alternatives.

The Decision concluded that the record contained a sufficient analysis of alternatives and complied with the requirements of the CEQA, the Warren-Alquist Act, and NEPA. Further, the evidentiary record contained an adequate review of alternative generation technology including that of rooftop photovoltaic and distributed generation, and the record contained an acceptable analysis of a reasonable range of site location and generation alternatives to the project proposed. (PSPP Final Decision, CEC-800-2010-011, Alternatives, pp. 40-41.)

## **SUMMARY AND DISCUSSION OF THE EVIDENCE**

The process to select alternatives to include in an alternatives analysis begins with the establishment of project objectives. Section 15124 of the CEQA Guidelines addresses the requirement for a statement of objectives (Cal. Code Regs., tit. 14, § 15124[b]):

A clearly written statement of objectives will help the lead agency develop a reasonable range of alternatives to evaluate in the EIR and will aid the decision makers in preparing findings or a statement of overriding considerations, if necessary. The statement of objectives should include the underlying purpose of the project.

According to Staff, the underlying purpose of the PSEGS is to implement California's Renewables Portfolio Standard (RPS) program, which was established in 2002 under Senate Bill (SB) 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB X 1-2. Other related legislation has altered specific parts of the RPS program. The RPS program requires a retail seller of electricity to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. The California Public Utilities Commission (CPUC) and the Energy Commission are jointly responsible for implementing the program. (Ex. 2000, p. 6.1-4.)

The importance of achieving these renewable energy goals was emphasized with the enactment of Assembly Bill (AB) 32, the California Global Warming Solutions Act of

2006, which sets aggressive greenhouse gas (GHG) reduction goals for the state. (Ex. 2000, p. 6.1-4.)

In February 2013, the project owner submitted a Right-of-Way Application (ROW) and revised Plan of Development (POD) to the U.S. Bureau of Land Management (BLM) for the PSEGS. In July 2013, the BLM published a draft Supplemental Environmental Impact Statement (SEIS) for the PSEGS. Based on the PSEGS SEIS, Staff provided a summary of the project owner's objectives, starting with the owner's primary objective to deliver 500 megawatts of renewable electrical energy to the regional electrical grid to fulfill its existing approved PPAs for electrical sales from the facility.

Other project objectives identified in the SEIS address developing the PSEGS at a site that meets the following criteria (Ex. 2000, p. 6.1-5):

- Develop a solar thermal power plant at a site where some of the permits and other authorizations required for construction have been completed and/or obtained;
- Develop a site that is large enough to accommodate BrightSource Energy's Solar Power Tower technology;
- Develop a site that is in a BLM-designated Solar Energy Zone; and
- Develop a project with an executed and approved LGIA for interconnection to a substation that would be operational in time to meet delivery of electricity under the approved PPAs. (Ex. 2000, p. 6.1-5.)

Staff reviewed the project objectives from the Commission Decision for the licensed PESP and assessed their applicability to the proposed modified project. Staff retained some of those original project objectives and incorporated other basic objectives that Staff believes are consistent with the state's following renewable energy goals:

- Safely and economically construct and operate a utility-scale solar energy project of up to 500 megawatts;
- Develop a renewable energy facility that will supply clean, renewable electricity, and assist Southern California Edison in satisfying its California RPS program goals;
- Ensure construction and operation of a renewable electrical generation facility that will meet permitting requirements and comply with applicable laws, ordinances, regulations, and standards (LORS);
- Develop a renewable energy facility in a timely manner that will avoid or minimize significant environmental impacts to the greatest extent feasible; and
- Develop a renewable energy facility in an area with high solar value and minimal slope.

Intervenor Center for Biological Diversity (CBD) argued that Staff's determination of project objectives was "too narrow." (CBD's 11/26/13 Opening Brief, p. 16.) The Petitioner concurred with Staff's determination of objectives and disagreed with CBD's characterization of the list of objectives as being too narrow. Petitioner argued that, although Staff's list of objectives was more expansive than the Petitioner's objectives, this was permissible in developing a range of alternatives to carry forward for analysis and full disclosure purposes. (Petitioner's 11/26/13 Opening Brief, p. 11.) The December 13, 2013 Presiding Member's Proposed Decision (PMPD, TN 201434) used the 10 project objectives listed above.

The original PMPD did not reach the question of the feasibility of alternatives in light of its recommendation to deny the project (PMPD, pp. 2-23; 2-34). Also, in the 2013 evidentiary hearings, Petitioner's expert testified that thermal energy storage could not be added to the PSEGS until the end of its financing horizon. (10/29/14 RT 86:8 – 22.) Therefore, we did not consider the potential to add storage as a benefit of the project in the PMPD. Although the PMPD recommended denial of the Petition to Amend the PSEGS project, the denial was without prejudice and the door was left open for the Petitioner to correct any evidentiary deficiencies in the event that the Petitioner sought to reopen the matter. (PMPD, p. 6.3-54.)

When the Petitioner's December 23, 2013 Request for a Delay in Schedule was granted (TN 201466), the PSEGS Amendment Committee immediately held a status conference on January 7, 2014. At the status conference, the Presiding Member articulated the Energy Commission's strong preference for projects with energy storage (1/7/14 RT 13:11-23; 24:1-11). After the Petitioner's March 21, 2014 Motion to Reopen the Evidentiary Record was granted (TN 202362), the Petitioner offered evidence in support of a future amendment that would present modifications to incorporate thermal energy storage. Petitioner's proposed Condition of Certification **Project Description–1** would require an amendment incorporating thermal energy storage prior to construction of Phase II. (Ex. 1166, p. 3.) While we have not imposed Condition of Certification **Project Description–1** at this time, we find that the ability to add thermal energy storage is an important benefit of this project. The evidence indicates that solar power towers may be uniquely optimized to provide thermal energy storage, and that power tower technology can deliver superior thermal energy storage performance. That is, it can shift generation to periods of higher demand more cost effectively and with fewer constraints than other solar technologies, due largely to the higher operating temperature. (7/30/14 RT 167:3-172:19; Ex. 1143.) For example, Abengoa is designing a solar power tower project in Chile with thermal energy storage with 17.5 hours of storage to meet a 24 hour demand for energy. (7/30/14 RT 211:8 – 15.) Therefore, we will identify the ability to add thermal energy storage that would significantly extend the time during which power would be

delivered to the grid as an important objective of the PSEGS project. We further find that the State of California is best served by a diverse portfolio of renewable energy sources with technologies that can readily accommodate thermal energy storage. (Pub. Resources Code, § 25000.1(a).) (Ex. 2000, p. 6.1-4; 7/30/14 RT 170:2 – 171:19.)

The Petitioner has invested resources at its own risk to secure needed approvals over a period of years. (Ex. 1124, p. 2.) Petitioner argues that a real project with almost all of its needed approvals that is ready for construction is more likely to provide near-term benefits to the state in terms of RPS compliance, jobs, reduced greenhouse gas emissions, etc. than a conceptual project that might be built sometime in the future. (7/30/14 RT 83: 17 – 84:6.)

We find that Petitioner's objectives too narrowly limit the project objectives to allow consideration of a reasonable range of alternatives. Therefore, we adopt the first of the Petitioner's project objectives, as well Staff's five project objectives, and we add the following two major project objectives:

- Develop a solar energy project that contributes diversity to California's renewable energy supply and readily accommodates thermal energy storage that can shift electricity generation into hours of peak demand; and
- Certify a solar energy project with a high likelihood of commencing commercial operation before the RPS deadline of January 1, 2020.

**Table 1 - Revised PSEGS Project Objectives**

No.	Description of Project Objective
1	Deliver 500 megawatts of renewable electrical energy to the regional electrical grid to fulfill its existing approved power purchase agreements (PPA) for electrical sales from the facility. (This is Petitioner's main objective).
2	Safely and economically construct and operate a utility-scale solar energy project of up to 500 megawatts.
3	Develop a renewable energy facility that will supply clean, renewable electricity, and assist Southern California Edison in satisfying its California Renewables Portfolio Standard program goals.
4	Ensure construction and operation of a renewable electrical generation facility that will meet permitting requirements and comply with applicable laws, ordinances, regulations, and standards (LORS).
5	Develop a renewable energy facility in a timely manner that will avoid or minimize significant environmental impacts to the greatest extent feasible.
6	Develop a renewable energy facility in an area with high solar value and minimal slope.
7	Develop a solar energy project that contributes diversity to California's renewable energy supply with a technology that readily accommodates thermal energy storage; and
8	Certify a solar energy project with a high likelihood of commencing commercial operation before the RPS deadline of December 31, 2020. This is a major objective of the Energy Commission.

## **Alternatives Considered but Eliminated from Detailed Consideration for PSEGS**

Staff initially evaluated a 500-MW Solar Power Tower (SPT) with a Lower Tower Height Alternative and an SPT with Energy Storage Alternative and determined that the impacts of the proposed modified project would not be reduced or avoided with construction and operation of these alternatives at the PSEGS site. (Ex. 2000, p. 6.1-11.) We find Staff's elimination of these alternatives from analysis is reasonable.

### Off-site Alternatives

As described above, several off-site alternatives were evaluated in the previous analysis for the PSPP, including the North of Desert Center Alternative. According to Staff, use of this alternative site to construct a 500-MW SPT power plant similar to the PSEGS project could potentially cause impacts on visual resources that would be much greater than the PSEGS. Evidence indicates that impacts on local residents, the Desert Center Airport, and recreational visitors to the Chuckwalla Valley Raceway from the effects of glint and glare would be significant. Impacts on avian species would be similar to the PSEGS. Staff suggests that construction and operation of a renewable solar power plant using SPT technology at the North of Desert Center Alternative site would probably have impacts similar to or somewhat greater than PSEGS. Although it is unknown how many residences may be located at the North of Desert Center Alternative site, Staff presumes that displacement of residents could be an impact of a utility-scale solar project at this site. (Ex. 2000, p. 6.1-15.)

Staff opines that if a new potential off-site alternative were identified, construction of a utility-scale solar energy project using SPT technology would be highly unlikely to reduce environmental impacts on visual resources, cultural resources, or biological resources. Any off-site alternative at a disturbed site is likely to be closer to developed areas, and potential impacts on local residents and adjacent developed uses from construction and operation of the PSEGS at such a site would be greater compared to the approved PSPP site. Potential impacts on avian species would be similar to the PSEGS regardless of the site location. Staff opines that it is unlikely that a different off-site alternative would cause fewer impacts to critical environmental resources. Staff concludes that it is improbable that an off-site alternative could be identified where it would be feasible to achieve site control and use within a reasonable time frame. (Ex. 2000, pp. 6.1-15 – 6.1-16.)

In July 2012, the BLM and the U.S. Department of Energy (DOE) published the *Final Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States*. The Record of Decision (ROD) for the Solar PEIS was issued a few months later. The Riverside East Solar Energy Zone (SEZ) is one of the extensive regions encompassing public lands in the southwestern states that was subject to

environmental review and determined to be appropriate for development of renewable energy projects with implementation of design features to reduce the environmental impacts of those projects. The evidence shows that the PSEGS site is in the Riverside East SEZ and most of the PSEGS site appears to be in an area delineated as “developable.” (Ex. 2000, p. 6.1-16.)

The Desert Renewable Energy Conservation Plan (DRECP) is a multi-agency conservation and planning document intended to guide solar and other renewable energy project sitings in the Mojave and Colorado/Sonoran Deserts of California, and provide for the conservation and management of certain species, habitats, and natural communities that may be affected by those projects. The state and federal agencies that are developing the DRECP are collectively called the Renewable Energy Action Team (REAT) agencies. The Draft Preliminary Conservation Strategy (Draft PCS) is a key part of the DRECP that was published by the REAT agencies in October 2011. The Draft PCS identified preliminary renewable energy study areas (RESAs) based on the presence of available renewable energy resources and a lower potential for conflicts with conservation goals. The preliminary conservation strategy map of the RESAs includes approximately 382,390 acres in east Riverside County near Blythe. The Blythe RESA encompasses an area around Interstate 10 (I-10) that overlaps extensively with the Riverside East SEZ. (Ex. 2000, p. 6.1-16.)

The REAT agencies are developing the DRECP alternatives for consideration in the draft DRECP. In a January 2013 publication on the *Description and Comparative Evaluation of Draft DRECP Alternatives*, four of the preliminary DRECP alternatives were noted to retain the entire Riverside East SEZ as a development focus area (DFA) under the DRECP. The other three were noted to retain portions of the Riverside East SEZ as a DFA. The DRECP will ultimately only cover and provide permit streamlining for renewable energy generation projects inside DFAs. Although the PSEGS site is approved for a utility-scale solar energy project, the extent of the DFA in the project area and its relationship to the PSEGS site remains undetermined. (Ex. 2000, p. 6.1-16.)

To summarize, the PSPP site was licensed by the Energy Commission in 2010 for construction and operation of either Reconfigured **Alternative #2** or **#3**. The Commission Decision for the PSPP concluded that no off-site alternative would present a feasible alternative to the licensed site, and that the environmental impacts of the off-site alternatives would generally be similar to the PSPP. The PSEGS site is within the Riverside East SEZ, which indicates at least its potential suitability for development of a renewable energy facility. According to Staff’s updated analysis for PSEGS, there is no identified off-site location that would avoid or substantially lessen any of the significant effects of the PSEGS project. Staff adds that there are no identified feasible alternative

locations for the PSEGS where site control and use could be obtained in a reasonable time frame. (Ex. 2000, p. 6.1-17.) We find that eliminating this alternative from further analysis is appropriate.

### Distributed Generation

Governor Jerry Brown's Clean Energy Jobs Plan identifies a goal of installing 20,000 MWs of new renewable capacity by 2020, including 12,000 MWs of localized electricity generation close to consumer loads and transmission and distribution lines (i.e., distributed generation (DG))<sup>1</sup>. These targeted renewable capacity goals support California's RPS program goals. In 2010, the state had more than 10,000 MWs of installed renewable capacity that provided nearly 16 percent of total retail sales of electricity. Of that amount, about 3,000 MWs represents DG, and there is an additional estimated 6,000 MWs of DG either under development or authorized under existing programs. (Ex. 2000, p. 6.1-17.)

Distributed solar facilities vary in size from kilowatts to tens of megawatts and do not require transmission to get to the areas where the electricity is used. Renewable DG technologies like small PV can be located in industrial areas on previously disturbed land or on existing residential, industrial, or commercial buildings. Standards, codes, and fees vary widely for DG projects, and land use requirements for identical systems can vary significantly from jurisdiction to jurisdiction. The record contains a thorough explanation of current policies and programs designed to develop a modern and smart distribution network that can actively accommodate high levels of DG. (Ex. 2000, pp. 6.1-17 – 6.1-20.)

CBD offered expert testimony suggesting that distributed solar alternatives to PSEGS would be feasible. CBD's expert opined that higher than anticipated net-metered rooftop PV additions over the next several years brought about by the passage of AB 327 would render moot the justification that there is a need for a remote solar thermal project at the Palen site. He stated that solar PV in any format, either utility-scale PV or large-scale distributed PV on rooftops, is a lower-cost, lower environmental impact alternative than the proposed PSEGS project. (7/30/14 RT 96:5 – 99:21; Ex. 3113.) On rebuttal, CBD's expert argued that distributed PV located in urban load pockets would eliminate the migratory bird impacts of PSEGS and provide local capacity for enhanced grid reliability. (Ex. 3146.)

Petitioner's expert testified that it would require 1,500 - 2,000 individual rooftop PV projects to equal the energy production of PSEGS. This would require the identification of thousands of different potential sites, individual rooftop lease negotiations with

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<sup>1</sup> The total 20,000 MWs from the Governor's Clean Energy Jobs Plan includes 8,000 MWs of utility-scale renewable capacity from wind, solar, and geothermal projects.

thousands of building owners, and individual PPA for each project. He explained that AB 327 does not establish a statutory mandate for investor-owned utilities (IOUs) to add or interconnect rooftop PV. Rather, AB 327 establishes a *ceiling* on *customer-owned* PV allowed under current net energy metering rules. His testimony explained that PV does not help California load-serving entities (LSE) reach the 33 percent RPS requirement in 2020 because renewable energy credits (RECs) generated by behind-the-meter PV are “Category 3 RECs,” which can be used for only 10 percent of an LSE’s total RPS-compliant energy in 2020. Currently, there is a surplus of Category 3 RECs. Finally, Petitioner’s expert testified that customer-sited PV is installed and maintained entirely at the discretion of individual utility customers. These customers make the decision whether or not to invest in PV based on their own economic and/or altruistic motivations. Thus, while programs can encourage the adoption of distributed PV that in aggregate can equal the output from a single larger system, customer-sited PV is not a project sponsored by or under the control of the utilities. The collection of individual actors needed to install customer-sited PV to equal a single utility-scale project makes it impractical to consider this model as a viable direct alternative to PSEGS (emphasis in the original). We note that Petitioner’s expert’s opinions were supported by factual and legal citations in the record. (7/30/14 RT 102:13-106:1; Ex. 1179.)

Staff testified that comments received during the proceedings for other siting cases for large-scale renewable energy projects have stated that the alternatives analyses for such central station projects must include the distributed generation photovoltaic (DGPV) category of renewable energy generation. Both *concentrated* and *distributed* types of systems result in production of electricity from renewable sources (i.e., both use solar technologies). However, the characteristics of the DG category of renewable energy generation make it an impracticable alternative in the context of a CEQA alternatives analysis. In no instance has a potential site for a DGPV alternative been proposed. (Ex. 2000, p. 6.1-20.) Staff, in accord with Petitioner’s expert above, concluded that a DGPV alternative does not provide a feasible alternative to the proposed modified project for several reasons. (Ex. 2000, p. 6.1-21.)

First, Staff testified that achieving a level of electrical generation comparable to the proposed PSEGS would require putting together many small-scale (approximately 1–5 MWs each) sites that could, in theory, include rooftop and ground-mounted PV systems. Even if such sites could be identified, it is unreasonable to assume that the Petitioner could obtain access to and use of multiple small sites that are owned and controlled by other people or organizations. As Petitioner’s expert stated above, participation in on-site generation programs is voluntary. Thus, Staff concludes that the feasibility of a renewable DG alternative is extremely speculative. (Ex. 2000, p. 6.1-21.)

Secondly, as Petitioner's expert testified above, participation in the incentive programs is elective; no laws or regulations mandate installation of on-site renewable energy systems, and utilities do not approve or deny DG systems on private property. Although the importance of the state's DG incentive programs cannot be overstated, it is not possible to treat a conglomeration of DGPV (or other types of DG) projects as a potentially feasible alternative to a utility-scale renewable energy project such as the PSEGS project. (Ex. 2000, p. 6.1-21.) Indeed, DG is a partner not a competitor or a replacement for utility scale solar. (7/30/14 RT 94:9-13.)

Finally, the basic project objectives for the PSEGS include developing a renewable energy facility that would contribute to meeting the state's RPS program goals. Based on electricity supply and demand forecast reports prepared by Energy Commission Staff, as well as expert witness testimony in other proceedings, renewable DG projects alone would not supply enough electricity to meet the state's mandated RPS program goals. Achieving the RPS program goals requires energy generation from a mix of renewable sources, and not merely one to the exclusion of others. Various agency publications identify the need to increase renewable generating capacity from DG and utility-scale sources; both are essential to successfully meeting RPS program goals. Therefore, Staff concludes that rejection of the PSEGS on the grounds that some renewable DG projects would be built would be inconsistent with the state's RPS program objectives. Such a decision would also be inconsistent with the PSEGS goals of helping to meet such objectives. (Ex. 2000, p. 6.1-21.)

As noted above, we found in the PSPP Decision that distributed generation should complement, rather than substitute for, large central station renewable energy facilities. The evidence presented in the PSEGS amendment process supports that conclusion and also provides evidence about the difficulty of comparing DG to utility scale generation and supports the inapplicability of new DG to the 33 percent RPS goal. We find that Staff's decision to eliminate DG from detailed consideration as an alternative to the PSEGS is reasonable and appropriate.

## Energy Efficiency

In 2003, the principal energy agencies in the state jointly created and adopted the Energy Action Plan (EAP), which identifies goals and actions to eliminate energy outages and excessive price spikes in electricity and natural gas. The EAP states the importance of having reasonably priced and environmentally sensitive energy resources to support economic growth and attract new investments that will provide jobs and prosperity for California consumers and taxpayers. The EAP envisions a “loading order” of energy resources to guide agency decisions: (1) the agencies will optimize all strategies for increasing conservation and energy efficiency to minimize increases in electricity and natural-gas demand; (2) recognizing that new generation is necessary and desirable, the agencies intend to meet the need first by renewable energy resources and distributed generation; and (3) because the preferred resources require

both sufficient investment and adequate time to “get to scale,” the agencies will support additional clean, fossil-fueled, central station generation. California Public Utilities Code section 454.5(b) addresses requirements for an electrical corporation’s proposed procurement plan, including the requirement to “first meet its unmet resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.” (Ex. 2000, p. 6.1-22.)

As described in the 2011 IEPR, California’s energy efficiency policies, programs, and energy standards for buildings and appliances in the last three decades have contributed to keeping the state’s per capita electricity consumption relatively constant, while energy use in the rest of the country has increased by approximately 40 percent. In addition to achieving all cost-effective energy efficiency, California’s energy efficiency policies include reducing energy use in existing buildings and achieving zero net energy building standards. Reducing building energy use to zero net energy is accomplished by combining greater energy efficiency and on-site clean energy production. (Ex. 2000, p. 6.1-23.)

But while energy efficiency is a critical piece of the state’s energy policy, it cannot achieve the basic objectives of the proposed project. Energy efficiency programs reduce electricity demand, which in turn reduces the amount of electrical generation that must be procured to meet demand. While energy efficiency does not directly contribute to achieving the 33 percent RPS by 2020, it does indirectly contribute by reducing the amount of renewable energy needed to meet the 33 percent. However, energy efficiency cannot provide the delivery of a specific quantity of electrical energy to a regional electrical grid. The energy saved from the more efficient use of electricity cannot help the project proponent fulfill its existing PPA for electrical sales from the facility, nor can it provide electricity to reliably meet remaining demand after implementation of energy efficiency and other demand reduction programs. (Ex. 2000,

p. 6.1-24.) Accordingly, we find that Staff's decision to eliminate energy efficiency from detailed consideration as an alternative to the PSEGS is reasonable and appropriate.

### **ALTERNATIVES RETAINED FOR FUTURE ANALYSIS**

CEQA requires consideration of "a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible." (Cal. Code Regs., tit. 14, § 15126.6[a].) Feasible is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." (Cal. Code Regs., tit. 14, § 15364.)

The record identifies project alternatives that were selected for further analysis based on their potential to satisfy most of the basic project objectives (discussed above) and their potential to reduce or avoid the significant impacts identified for the PSEGS amendment. (Ex. 2000, p. 6.1-24.)

Staff selected three project alternatives for full analysis and comparison to the proposed modified project:

- No-project Alternative, which is also the PSPP solar trough technology alternative;
- Solar Photovoltaic Alternative with Single-Axis Tracking Technology; and
- Reduced Acreage Alternative with Solar Power Tower Technology.

#### **No-project Alternative**

The No-project Alternative analysis must "discuss the existing conditions at the time...environmental analysis is commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Cal. Code Regs., tit. 14, § 15126.6[e][2]). As required by CEQA, a No-project Alternative has been included to allow a comparison of the impacts of approving the PSEGS with the impacts of not approving the PSEGS. (Ex. 2000, p. 6.1-25.)

The CEQA Guidelines discuss possible ways for the discussion of the No-project Alternative to proceed. "If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this 'no project' consequence should be discussed. In certain instances, the no project alternative means 'no build' wherein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project's non-approval and not create and analyze a set of artificial assumptions that

would be required to preserve the existing physical environment.” (Cal. Code Regs., tit. 14, § 15126.6 [e][3][B].) (Ex. 2000, p. 6.1-25.)

The PSPP treated the No-project Alternative as a “no-build” alternative, meaning no development on the project site. This alternative was evaluated in detail in the PSPP proceeding and the project modifications evaluated in the PSEGS proceeding do not require changes to that analysis. The no-build alternative assumes that if the PSEGS application were denied, the construction and operational impacts of the PSEGS would not occur. There would be no site disturbance and no loss of resources or disturbance of desert habitat. The direct and cumulative impacts to visual, biological, and cultural resources would be avoided. (PSPP Final Decision, CEC-800-2010-011, **ALTERNATIVES** section, pp. 17-18.)

The PSPP found the no-build alternative failed to meet most of the basic project objectives, including compliance with important state energy policy. Specifically, this alternative would not help the state achieve its RPS and greenhouse gas reduction goals in a timely manner. For these reasons, the PSPP concluded that the no-build alternative does not meet project objectives. This conclusion applies equally to the PSEGS.

The fact that the PSEGS is an amendment to the certified PSPP means that PSPP (rather than the no-build alternative) is the No-project Alternative for this amendment proceeding. We, therefore, call PSPP the “No-project Alternative,” or “PSPP” for purposes of this alternatives analysis.

Description of the Alternative: The PSPP, located roughly on the same site as the PSEGS, was previously certified by the Energy Commission for development of two adjacent and identical 250-MW parabolic trough power plants with a net generating electrical capacity of 500 MWs. Reconfigured **Alternatives #2** and **#3** both received the Energy Commission’s approval in December 2010. The No-project Alternative evaluates the impacts of the PSEGS project compared to the impacts of constructing and operating either of the approved alternatives from the original proceeding for the PSPP. **Alternatives Figures 1a** and **1b** show the site layouts for PSPP’s Reconfigured **Alternatives #2** and **#3**. Staff’s conclusions for the potential environmental impacts of the No-project Alternative are based on the analyses and conclusions in the 2010 Commission Decision for the original PSPP. (Ex. 2000, p. 6.1-25.)





site for generation of solar energy is a probable outcome should the current ROW application be denied. (Ex. 2000, p. 6.1-26.)

As described in the Commission Decision for the PSPP, development of a parabolic trough project using one of the two approved site plans would have an overall disturbance area of up to approximately 4,365 acres. Reconfigured **Alternative #2** would disturb about 35 more acres compared to Reconfigured **Alternative #3**. The site boundary for the previously approved Reconfigured **Alternative #2** includes approximately 284 acres of private land. Reconfigured **Alternative #3** includes one 40-acre parcel under private ownership. The original project applicant had an option to purchase the 40-acre parcel that was part of Reconfigured **Alternative #3**. The altered site boundary for the PSEGS avoids the privately-owned land that was inside the fence line for the previously approved alternatives. (Ex. 2000, p. 6.1-26.)

The PSEGS site slopes gently from the southwest to the northeast with a decrease in elevation to the northeast. The site contains native vegetation, including vegetated and unvegetated ephemeral washes entering the site from the south and fanning out across the site as the slope decreases. The I-10 corridor and concomitant drainage improvements have impaired natural flows throughout the valley. Surface waters drain to the Palen Dry Lake northeast of the modified project site and remain wholly within the Chuckwalla Valley. The site borders an active sand transport corridor, and much of the site has sandy soils and is rather sparsely vegetated. Portions of the site are uneven and hummocky. The site is undeveloped and unimproved desert open space. No site grading or earth movement was initiated at the site following approval of the original PSPP, and site conditions are substantially the same as they were in 2009–2010 during the original proceeding. (Ex. 2000, p. 6.1-26.)

A parabolic trough system converts solar radiation into electricity using sunlight to heat a thermal fluid, typically synthetic oil. Parabolic trough power plants like the approved PSPP consist of horizontal, trough-shaped solar collectors that are arranged in parallel rows and aligned on a north-south horizontal axis. Each parabolic trough collector has a linear parabolic-shaped reflector that focuses the sun's rays on a linear receiver tube (i.e., heat collection element) suspended at the focal point of the curve-shaped collector. The trough rotates east to west to track the sun during the day, heating the heat transfer fluid (HTF) circulating in the collection element. The heated HTF is then piped through a series of heat exchangers where it releases its stored heat to generate high pressure steam. The steam is then fed to a traditional steam turbine generator where electricity is produced. **Alternatives - Figures 2a** and **2b** show photographs of parabolic trough project facilities. (Ex. 2000, p. 6.1-27.)

**ALTERNATIVES - FIGURE 2a**

Palen Solar Electric Generating System - No-Project Alternative, Examples of Parabolic Trough Project Facilities

Two views of the Solar Electric Generating Systems Projects at Kramer Junction



(Ex. 2000, Alternatives Figure 2a.)

**ALTERNATIVES - FIGURE 2b**

Palen Solar Electric Generating System - No-Project Alternative, Examples of Parabolic Trough Project Facilities

Parabolic troughs like those originally proposed to be used at the Blythe Solar Power Project in California



Source: Energy Commission

Typical Solar Collector Assembly for Parabolic Trough Installation



Source: Palen Solar 1 2010

(Ex. 2000, Alternatives Figure 2b.)

Beginning in 1984, nine solar power plants using parabolic trough technology were constructed in the Mojave Desert in San Bernardino County. Solar Electric Generating Systems (SEGS) III through VII are at Kramer Junction (**Alternatives - Figure 2a**), SEGS VIII and IX are at Harper Lake, and SEGS I and II are at Daggett, near Barstow. The nine SEGS projects have a combined total capacity of 354 MWs. These power plants cover a combined total of more than 1,600 acres. (Ex. 2000, p. 6.1-27.)

In 2008 and 2009, the Energy Commission received AFCs for several renewable energy projects that were proposed to use parabolic trough technology, including the PSPP. Staff is monitoring construction and operation of two of the projects in the vicinity of the PSEGS project that were licensed by the Energy Commission in September 2010, namely the Abengoa Mojave Solar Project (AMSP) and the Genesis Solar Energy Project (GSEP). (Ex. 2000, p. 6.1-27.)

Each project consists of two 125-MW power plants for a combined total capacity of 500 MWs. Commercial operation of AMSP is anticipated during the fourth quarter of 2014. Commercial operation of the two GSEP power plants began in November 2013 and March of 2014. When construction of the AMSP is finished, it will cover approximately 1,765 acres. The GSEP covers approximately 1,800 acres.

Construction and operation of the PSEGS, including the common area and construction lay-down area, requires approximately 3,794 acres. Staff assumed that the disturbance area for the No-project Alternative with construction of either Reconfigured **Alternative #2** or **#3** would affect an area up to roughly 570 acres larger than the area for the PSEGS project. (Ex. 2000, p. 6.1-28.)

Site grading and earthwork for a parabolic trough project generally requires removal of all vegetation and mass grading to level the site. The approved PSPP would require excavation for foundations and underground systems and a total cut and fill volume of approximately 4.5 million cubic yards. The amended PSEGS would reduce that requirement to approximately 0.2 million cubic yards of cut and fill. (Ex. 2000, p. 6.1-28.)

### Environmental Analysis

The Final Staff Assessment (FSA, or Exhibit 2000) contains a detailed comparison of the impacts of the No-project Alternative to the PSEGS project. (Ex. 2000, pp. 6.1-30 – 6.1-51.) **Alternatives - Table 2** below summarizes the comparison of impacts of the amended PSEGS and the impacts under the No-Project Reconfigured **Alternative #2** or **#3**. Any differences in impacts that occur from comparing Reconfigured **Alternatives #2** and **#3** to the proposed PSEGS are shown in the table. The comparisons of impacts to the proposed modified project are conveyed using these terms in a graded scale:

- Much less than PSEGS
- Less than PSEGS
- Somewhat less than PSEGS
- Similar to PSEGS
- Same as PSEGS
- Somewhat greater than PSEGS
- Greater than PSEGS
- Much greater than PSEGS

Impact conclusions for the PSEGS project and the comparative impacts for the alternatives are shown using these abbreviations:

-- = no impact

B = beneficial impact

LS = less-than-significant impact, no mitigation required

SM or PSM = significant or potentially significant impact that can be mitigated to less than significant

SU or PSU = significant and unavoidable or potentially significant and unavoidable impact that cannot be mitigated to less than significant (Ex. 2000, p. 6.1-30.)

No comparative analysis was included in the FSA for noise and vibration because no significant noise and vibration impacts were identified for the PSEGS project, and noise and vibration impacts would be similar for the project alternatives. Also, there was no comparative analysis of transmission line safety and nuisance because the point of interconnection at the Red Bluff Substation would not change. The length and location of the 230-kV transmission line connecting the PSEGS project to the substation would be the same for the project alternatives. All federal, state, and local regulations and standard industry practices that apply to the PSEGS project would also apply to the project alternatives. (Ex. 2000, p. 6.1-30.)

Comparative discussions for each environmental topic area listed below follow **Alternatives - Table 2.**

**Alternatives - Table 2**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the No-Project Alternative**

Environmental Effect	Proposed PSEGS	No-Project Alternative
		<b>Reconfigured Alternative #2 or #3</b>
<b>Air Quality</b>		
Construction-related emissions	SM (locally)	Similar to PSEGS (SM)
Project operations emissions	SM (locally)	Somewhat greater than PSEGS (SM)
Reduction in greenhouse gases	B (system wide)	Similar to PSEGS (B)
<b>Biological Resources</b>		
Impacts on special-status plant species	SM	Greater than PSEGS (SM)
Impacts on waters of the state	SM	Much greater than PSEGS (SM)
Impacts on desert tortoise	SM	Greater than PSEGS (SM)
Impacts on special-status terrestrial wildlife species (kit fox, American badger)	SM	Greater than PSEGS (SM)
Potential impacts on avian species from collisions with project features	PSU	Similar to PSEGS (PSU)
Potential impacts on avian species from exposure to concentrated solar flux	PSU	—
Potential impacts on groundwater dependent ecosystems	SM	Somewhat greater than PSEGS (SM)
Impacts on sand transport corridor	SM	Somewhat less than PSEGS (SM)
Impacts on sand dunes and Mojave Fringe-toed Lizard	SM	Somewhat less than PSEGS (SM)
<b>Cultural Resources</b>		
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>on</i> the facility site, resources recommended or assumed to be historically significant ( <i>see cultural resources note</i> )	PSM	Somewhat greater than PSEGS (SM)
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (SM)
Potential for cumulatively considerable degradation of prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (PSM)
Potential impacts on significant built-environment cultural resources <i>on</i> the site	LS	Similar to PSEGS (LS)
Potential impacts on a significant built-environment cultural resource (Desert Center) <i>beyond</i> the site	SU	Much less than PSEGS (LS)

**Alternatives - Table 2**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the No-Project Alternative**

Environmental Effect	Proposed PSEGS	No-Project Alternative
		<b>Reconfigured Alternative #2 or #3</b>
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	PSM	Similar to PSEGS (PSM)
Potential for cumulatively considerable degradation of ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	LS	Similar to PSEGS (LS)
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (PSM)
Potential for cumulatively considerable degradation of ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (PSM)
<i>Cultural resources note:</i> "Site" means the facility site proper and does not include linear or ancillary infrastructure away from the facility site.		
<b>Fire Protection</b>		
<b>Construction-Related Impacts</b>		
Impacts on the Riverside County Fire Department	SM	Somewhat greater than PSEGS (SM)
<b>Project Operations Impacts</b>		
Become familiar with and plan for emergency responses	SM	Less than PSEGS (SM)
Conduct plan reviews, inspections, and permitting	SM	Somewhat greater than PSEGS (SM)
Fire response	SM	Much greater than PSEGS (SM)
Hazardous materials spill response	SM	Much greater than PSEGS (SM)
Rescue	SM	Somewhat less than PSEGS (SM)
Emergency medical services	SM	Same as PSEGS (SM)
<b>Geology and Paleontology</b>		
Potential impacts from strong seismic shaking	SM	Much less than PSEGS (SM)
Potential impacts from soil failure caused by liquefaction, hydrocollapse, and/or dynamic compaction	SM	Much less than PSEGS (SM)
Potential impacts on paleontological resources	SM	Less than PSEGS (SM)
Potential impacts on geological or mineralogical resources	—	—
<b>Hazardous Materials Management</b>		
<b>Construction-Related Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Same as PSEGS (SM)
Potential for spills or other releases of hazardous materials to occur off-site	LS	Same as PSEGS (LS)

**Alternatives - Table 2**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the No-Project Alternative**

Environmental Effect	Proposed PSEGS	No-Project Alternative
		<b>Reconfigured Alternative #2 or #3</b>
<b>Project Operations Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Much greater than PSEGS (SM)
Potential for spills or other releases of hazardous materials to occur off-site	LS	Much greater than PSEGS (SM)
<b>Land Use</b>		
Compatibility with land use plan, policy, or regulation	SM	Somewhat greater than PSEGS (SM)
<b>Public Health</b>		
Potential for project construction to cause air toxics-related or other impacts that could affect public health	LS	Somewhat greater than PSEGS (LS)
Potential for project operations to cause air toxics-related or other impacts that could affect public health	PSM	Similar to PSEGS (PSM)
<b>Socioeconomics</b>		
Environmental justice population within 6-mile buffer.	—	—
Induce substantial population growth in an area, either directly or indirectly	LS	Similar to PSEGS (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere	LS	Similar to PSEGS (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation	LS	Similar to PSEGS (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees	B	Similar to PSEGS (B)
<b>Soil and Water Resources</b>		
Soil erosion by wind and water during project construction	SM	Much greater than PSEGS (SM)
Soil erosion by wind and water during project operations	PSM	Less than PSEGS (PSM)
Water quality impacts from contaminated storm water runoff	SM	Somewhat greater than PSEGS (SM)
Water quality impacts from storm damage	PSM	Greater than PSEGS (PSM)
Water quality impacts from power plant operations	SM	Similar to PSEGS (SM)
Water quality impacts from sanitary waste	SM	Similar to PSEGS (SM)
Potential impacts from on-site and off-site flooding	PSM	Less than PSEGS (PSM)
Potential to impede or redirect 100-year flood flows, as shown on Federal Emergency Management Agency maps	—	—

**Alternatives - Table 2**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the No-Project Alternative**

Environmental Effect	Proposed PSEGS	No-Project Alternative
		<b>Reconfigured Alternative #2 or #3</b>
Potential impacts on local wells	PSM	Somewhat greater than PSEGS (PSM)
Potential impacts on groundwater basin balance	PSM	Somewhat greater than PSEGS (PSM)
<b>Traffic and Transportation</b>		
Potential damage to roads	PSM	Less than PSEGS (PSM)
Level of service on roads and highways – construction	PSM	Less than PSEGS (PSM)
Level of service on roads and highways – operation/post-construction	LS	Similar to PSEGS (LS)
Solar collector glint and glare impacts on motorists and pilots	PSM	Much less than PSEGS (PSM)
Solar receiver glare impacts that could be hazardous to motorists and pilots	PSM	Much less than PSEGS (LS)
<b>Visual Resources</b>		
<b>Construction-Related Impacts</b>		
Potential for adverse impacts on scenic vistas	SM	Greater than PSEGS (SM)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SM	Greater than PSEGS (SM)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	SM	Similar to PSEGS (SM)
<b>Project Operations Impacts</b>		
Potential for adverse impacts on scenic vistas	SU	Somewhat less than PSEGS (SU)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SU	Less than PSEGS (SU)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area <i>(individual effects listed below)</i>		
Glint or glare effects from project structures other than the reflective surfaces of solar collectors (i.e., heliostats, parabolic troughs, PV panels)	SM	Similar to PSEGS (SM)
Glint or glare effects from the solar collectors	SM	Similar to PSEGS (SM)
Glint or glare effects from high-profile solar receiver steam generators	SU	—
Light or glare from nighttime lighting effects, including Federal	SM	Similar to or less than

**Alternatives - Table 2**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the No-Project Alternative**

Environmental Effect	Proposed PSEGS	No-Project Alternative
		<b>Reconfigured Alternative #2 or #3</b>
Aviation Administration safety lighting		PSEGS (SM)
<b>Waste Management</b>		
Potential for unexploded ordnance to be present at the project site	PSM	Similar to PSEGS (PSM)
Potential for impacts on human health and the environment relating to past or present soil or water contamination	LS	Similar to PSEGS (LS)
Potential for impacts on human health and the environment relating to potential waste discharges	LS	Much greater than PSEGS (PSM)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	LS	Similar to PSEGS (LS)

(Ex. 2000, pp. 6.1-31 – 6.1-35.)

In most subject areas, the impacts of the PSEGS are similar to those of the PSPP. However, the PSPP impacts are less in the three areas that remain significant after imposition of feasible mitigation. The PSEGS impacts to biological resources are substantially greater than the PSPP (where mitigation would reduce them to a level that was not significant) and cannot be fully mitigated. The PSEGS impacts to cultural resources and visual resources are substantially greater than PSPP (where they were found to be significant and unmitigable) and remain unmitigable. These conclusions are explained more fully in the **BIOLOGICAL RESOURCES**, **VISUAL RESOURCES**, and **CULTURAL RESOURCES** sections of this Decision.

**Potential to Feasibly Attain Most of the Project Objectives While Avoiding or Substantially Lessening Significant Project Impacts**

The No-project Alternative could feasibly attain objectives 2, 3, 4, and 6. However, objective 1 (use of existing PPAs), objective 5 (develop a renewable energy facility in a timely manner), objective 7 (develop a solar energy project that contributes diversity to California’s renewable energy supply and readily accommodates thermal energy storage that can extend electricity generation into hours of peak demand), and objective 8 (commence operation before the RPS deadline of December 31, 2020) would not be met.

The evidence indicates that development of the No-project Alternative would require that the PPA and LGIA be re-negotiated (Ex. 1124, pp. 2-3, 5-6; Ex. 1147; Ex. 1150; Ex. 1151.) This means that the project owner would not be able to use the existing entitlements. It also means that it is highly unlikely that this alternative would be built in a timely manner, which is an objective of the project owner. Moreover, the delays

caused by the need to re-negotiate complicated agreements with both the CPUC and the California ISO severely undermine the ability of this project to contribute to the 2020 RPS goals. (Pub. Resources Code, § 25740.) Contributing to potential delays, Solar Millenium's proprietary technology that was approved in the PSPP certification is not available to the Petitioner, so were a developer to pursue the PSPP alternative, the developer would either have to acquire the certified technology or another permitting process would have to be conducted to certify a different trough technology. (7/30/14 RT 123:19-25.) This would essentially entail "starting over" on a process that takes five to eight years to complete. (7/30/14 RT 83:4 – 21.) As a matter of state policy, renewable projects that can make up for the loss of San Onofre Nuclear Generating Station and provide large scale employment are needed now, not eight years from now. (7/30/14 RT 83:22 – 84:8.) Staff testified that the BLM is considering the project owner's ROW application and revised POD for the PSEGS and has published a draft SEIS for the project. Staff's testimony assumes that changing the technology back to a parabolic trough project would require submittal of another revised POD to the BLM, which would also delay the project schedule. (Ex. 2000, p. 6.1-29.)

Given the importance of the States' RPS goals, we particularly focus on the phrase "within a reasonable time period" in CEQA's discussion of feasibility. (Pub. Resources Code, § 21061.1.) The uncontroverted evidence establishes that the No-project Alternative to the PSEGS project is incapable of being accomplished in a successful manner within a reasonable time period, because it would require embarking on several processes that could take five to eight years to complete. (7/30/14 RT 83:4 – 21.) We find that a five- to eight-year delay in this amendment petition is unreasonable, particularly in light of the project objectives.

Finally, we find that the No-project Alternative would not increase the diversity of the state's renewable energy portfolio. There are a number of trough projects in California; as noted above, the Energy Commission has licensed more than 850 MW of solar trough capacity that is either already operating or will begin operating in the near future. Evidence in the record indicates that power tower technology can readily accommodate thermal energy storage. (7/30/14 RT 50:12-18, 167:3-172:19, 208:5-23; Ex. 1143.)

Intervenor CBD argues that there are feasible alternatives to the solar power tower technology. (CBD 8/15/14 Opening Brief, p. 19.) CBD also argues that feasibility is not solely dependent upon Petitioner's subjective assessment and that economic infeasibility requires a comparison of the costs of the alternatives. (CBD 8/15/14 Opening Brief, pp. 20 - 21.) We agree in general with these points, but note that the Petitioner is not claiming that the trough and PV alternatives are economically infeasible. Instead, Petitioner contends that the alternatives cannot be accomplished within a reasonable time period. (7/30/14 RT 83:4 – 84:8.)

While we agree that the trough alternative is technologically feasible, the evidence demonstrates that business and economic circumstances are such that constructing a project with trough technology cannot be done within a reasonable time frame. (Ex. 1124, p. 6.) (Ex. 1150; 7/30/14 RT 121:5-19.) Policy favors enabling a viable project that adds to renewable diversity and is capable of accommodating efficient use of storage now instead of a hypothetical project that may never see the light of day. (Ex. 1124, p. 2; 7/30/14 RT 130:2 – 13.) We find the No-project Alternative cannot feasibly attain most of the basic objectives of the project.

The environmental analyses contained in the record indicate that in most subject areas, the impacts of the PSEGS compared to the PSPP are similar, but the PSPP creates fewer impacts in the three areas that remain significant after imposition of feasible mitigation. The PSEGS impacts to biological resources are substantially greater than the PSPP (where mitigation reduced them to a level that was not significant) and cannot be fully mitigated. The PSEGS impacts to cultural resources and visual resources are substantially greater than the PSPP (where they were found to be significant and unmitigable) and remain unmitigable. These conclusions are explained more fully in the **BIOLOGICAL RESOURCES**, **VISUAL RESOURCES**, and **CULTURAL RESOURCES** sections of this Decision. However, although we find that the PSPP alternative would have fewer significant impacts than the proposed PSEGS amendment, as discussed above, it would not feasibly attain most of the project's objectives.

### **Solar Photovoltaic (PV) Alternative with Single-Axis Tracking Technology**

Description of the Alternative: Solar PV technology involves the direct conversion of photons (i.e., sunlight) into electricity. PV modules (also called solar panels) absorb solar radiation and convert it into direct current electricity. This direct current power is then converted by an inverter device into alternating current electricity for delivery to the electrical grid system. The electrical current produced is directly dependent on how much light strikes the module. Multiple PV panels are wired together to form an array, an arrangement that increases the total system output. PV technology does not involve thermal energy or the production of steam to power turbines. PV systems are relatively simple to operate and maintain and require little water for project operations compared to solar thermal energy systems. (Ex. 2000, p. 6.1-51.)

The Solar PV Alternative would involve constructing and operating a utility-scale, single-axis tracking PV project at the PSEGS site. PV trackers using single-axis (east-west) tracking maximize the panels' absorption of sunlight during the day and throughout the year. Tracking PV modules produce more electricity annually compared to fixed-tilt modules. According to Staff, in 2012 the acreage requirement for all central station solar projects, including solar thermal and PV project types, was reduced from 9.1 acres per

MW to 7 acres per MW. Staff believes the modified efficiency ratio to be plausible and reasonable. (Ex. 2000, p. 6.1-52.)

**Alternatives - Table 3** lists five utility-scale, single-axis tracking PV projects that are approved and at different stages of development in California. Based on the generating capacities and acreage requirements for these sample projects, Staff assumed that a single-axis tracking solar PV project with an electrical capacity similar to the PSEGS could be constructed at the project site with no change to the site boundary. Operational water use for the PV projects listed in the table ranges from approximately 12.4 AFY for the California Valley Solar Ranch Project to approximately 15–22 AFY for the McCoy Solar Energy Project. The PSEGS project would require 201 AFY for project operations. (Ex. 2000, p. 6.1-52.)

The Solar PV Alternative would not require a natural-gas supply; therefore, this alternative would not require a new extension of the existing Southern California Gas distribution system to the project site boundary. (Ex. 2000, p. 6.1-52.)

The previous alternatives analysis for the licensed PSPP eliminated a utility-scale PV alternative from detailed consideration, stating that it would require more extensive site grading and a storm water management system that would be greater than the PSPP. However, several utility-scale PV developers are installing systems that minimize site grading and removal of on-site vegetation. Site restoration and revegetation are typically required to repair and restore areas that were disturbed during construction. Similar to the supporting piers for the heliostats, PV module supports are installed to allow storm water flows to cross the site. In addition to the projects shown in **Alternatives - Table 3**, PV projects are being installed in the state to minimize site disturbance and avoid or minimize cut and fill grading, including the Desert Sunlight Solar Farm Project in the Chuckwalla Valley and the Topaz Solar Farm Project on the Carrizo Plain. Therefore, the analysis of the Solar PV Alternative in the PSEGS FSA has conclusions that are different based on currently available information on potential environmental impacts from PV systems. The FSA describes in detail the PV technology used by the California Valley Solar Ranch (CVSR) Project and the McCoy Solar Energy Project (MSEP). (Ex. 2000, pp. 6.1-52 – 6.1-53.)

**Alternatives - Table 3**  
**Summary Descriptions of Five Approved Single-Axis**  
**Tracking Photovoltaic Projects in California**

Project Name and Location	PV Technology	Energy Capacity and Acres		Schedule
California Valley Solar Ranch Project, northeastern edge of the Carrizo Plain in southeastern San Luis Obispo County	Crystalline silicon PV panels attached to SunPower T0 Tracker® system (1,032 tracker units in ten arrays); single-axis tracking; about 757,320 solar panels	250 MWs; 1,500 acres		Project approved April 2011 and will be fully operational in 2013
Unit 1 of the McCoy Solar Energy Project, Riverside County approximately 13 miles northwest of Blythe	PV panels using single-axis trackers.	250 MWs; 2,186 acres		Record of Decision issued March 2013 on the whole 750-MW project; construction completion end of 2016
Quinto Solar PV Project, Merced County approximately 11 miles north of San Luis Reservoir	SunPower 425-watt monocrystalline solar panels attached to SunPower T0 Tracker® system; about 306,720 solar panels mounted on approximately 2,900 single-axis trackers	110 MWs; permanent structures (solar arrays, operation and maintenance structures, inverters, etc.) will cover approximately 528 acres of the 1,012-acre project site		Project approved 2012 and will be fully operational late 2014
Antelope Valley Solar Project I, Kern and Los Angeles counties in the Tehachapi area	SunPower 425-watt monocrystalline solar panels attached to SunPower T0 Tracker® system; about 1.875 million solar panels	325 MWs	Modified project site will cover approximately 4,642 acres; permanent structures will cover approximately 2,152 acres of the total site	Construction began in 2013 and power generation will begin in 2015
Antelope Valley Solar Project II, Kern and Los Angeles counties in the Tehachapi area		276 MWs		
(Ex. 2000, p. 6.1-53.)				

## Environmental Analysis

The FSA contains a thorough analysis of the probable impacts of the PV alternative compared to the PSEGS. **Alternatives - Table 4** presents a summary comparison of impacts of the PSEGS to the impacts of the Solar PV Alternative with Single-Axis Tracking Technology. The table uses the same abbreviations discussed above for the analysis of the PSPP No-project Alternative.

**Alternatives - Table 4**  
**Summary Comparison of Impacts of the Proposed PSEGS to the Solar Photovoltaic Alternative with Single-Axis Tracking Technology**

Environmental Effect	Proposed PSEGS	Solar PV Alternative
<b>Air Quality</b>		
Construction-related emissions	SM (locally)	Similar to PSEGS (SM)
Project operations emissions	SM (locally)	Less than PSEGS (SM)
Reduction in greenhouse gases	B (system wide)	Somewhat greater than PSEGS (B)
<b>Biological Resources</b>		
Impacts on special-status plant species	SM	Similar to PSEGS (SM)
Impacts on waters of the state	SM	Similar to PSEGS (SM)
Impacts on Desert Tortoise	SM	Similar to PSEGS (SM)
Impacts on special-status terrestrial wildlife species (Kit Fox, American Badger)	SM	Similar to PSEGS (SM)
Potential impacts on avian species from collisions with project features	PSU	Similar to PSEGS (PSU)
Potential impacts on avian species from exposure to concentrated solar flux	PSU	—
Potential impacts on groundwater dependent ecosystems	SM	Somewhat less than PSEGS (SM)
Impacts on sand transport corridor	SM	Somewhat less than PSEGS (SM) <i>(see biological resources note)</i>
Impacts on sand dunes and Mojave Fringe-toed Lizard	SM	Somewhat less than PSEGS (SM) <i>(see biological resources note)</i>
<i>Biological resources note: Comparative impacts for the Solar PV Alternative for indirect impacts on the sand transport corridor, sand dune habitat, and Mojave Fringe-toed Lizard cannot reasonably be characterized without further data and use of a sand transport model.</i>		
<b>Cultural Resources</b>		
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>on</i> the facility site, resources recommended or assumed to be historically significant <i>(see cultural resources note)</i>	PSM	Similar to PSEGS (PSM)
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (SM)
Potential for cumulatively considerable degradation of prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (SM)

**Alternatives - Table 4**  
**Summary Comparison of Impacts of the Proposed PSEGS to the Solar Photovoltaic Alternative with Single-Axis Tracking Technology**

Environmental Effect	Proposed PSEGS	Solar PV Alternative
Potential impacts on significant built-environment cultural resources <i>on</i> the site	LS	Similar to PSEGS (LS)
Potential impacts on a significant built-environment cultural resource (Desert Center) <i>beyond</i> the site	SU	Much less than PSEGS (SM)
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	PSM	Similar to PSEGS (PSM)
Potential for cumulatively considerable degradation of ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	LS	Similar to PSEGS (LS)
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (SM)
Potential for cumulatively considerable degradation of ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Much less than PSEGS (SM)
<i>Cultural resources note:</i> "Site" means the facility site proper and does not include linear or ancillary infrastructure away from the facility site.		
<b>Fire Protection</b>		
<b>Construction-Related Impacts</b>		
Impacts on the Riverside County Fire Department	SM	Much less than PSEGS (SM)
<b>Project Operations Impacts</b>		
Become familiar with and plan for emergency responses	SM	Much less than PSEGS (SM)
Conduct plan reviews, inspections, and permitting	SM	Much less than PSEGS (SM)
Fire response	SM	Much less than PSEGS (SM)
Hazardous materials spill response	SM	Much less than PSEGS (SM)
Rescue	SM	Somewhat less than PSEGS (SM)
Emergency medical services	SM	Much less than PSEGS (SM)
<b>Geology and Paleontology</b>		
Potential impacts from strong seismic shaking	SM	Much less than PSEGS (SM)
Potential impacts from soil failure caused by liquefaction, hydrocollapse, and/or dynamic compaction	SM	Much less than PSEGS (SM)
Potential impacts on paleontological resources	SM	Somewhat less than PSEGS (SM)
Potential impacts on geological or mineralogical resources	—	—
<b>Hazardous Materials Management</b>		

**Alternatives - Table 4**  
**Summary Comparison of Impacts of the Proposed PSEGS to the Solar Photovoltaic Alternative with Single-Axis Tracking Technology**

Environmental Effect	Proposed PSEGS	Solar PV Alternative
<b>Construction-Related Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Same as PSEGS (SM)
Potential for spills or other releases of hazardous materials to occur off-site	LS	Same as PSEGS (LS)
<b>Project Operations Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Much less than PSEGS (SM)
Potential for spills or other releases of hazardous materials to occur off-site	LS	Much less than PSEGS (LS)
<b>Land Use</b>		
Compatibility with land use plan, policy, or regulation	SM	Similar to PSEGS (SM)
<b>Public Health</b>		
Potential for project construction to cause air toxics-related or other impacts that could affect public health	LS	Similar to PSEGS (LS)
Potential for project operations to cause air toxics-related or other impacts that could affect public health	PSM	Less than PSEGS (LS)
<b>Socioeconomics</b>		
Environmental justice population within 6-mile buffer.	—	—
Induce substantial population growth in an area, either directly or indirectly.	LS	Similar to PSEGS (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere.	LS	Similar to PSEGS (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation.	LS	Similar to PSEGS (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees.	B	Similar to PSEGS (B)
<b>Soil and Water Resources</b>		
Soil erosion by wind and water during project construction	SM	Somewhat less than PSEGS (SM)
Soil erosion by wind and water during project operations	PSM	Less than PSEGS (PSM)
Water quality impacts from contaminated storm water runoff	SM	Somewhat greater than PSEGS (SM)
Water quality impacts from storm damage	PSM	Somewhat greater than PSEGS (PSM)
Water quality impacts from power plant operations	SM	Much less than PSEGS (SM)
Water quality impacts from sanitary waste	SM	Similar to PSEGS (SM)
Potential impacts from on-site and off-site flooding	PSM	Similar to PSEGS (PSM)
Potential to impede or redirect 100-year flood flows, as shown on Federal Emergency Management Agency maps	—	—
Potential impacts on local wells	PSM	Somewhat less

**Alternatives - Table 4**  
**Summary Comparison of Impacts of the Proposed PSEGS to the Solar Photovoltaic Alternative with Single-Axis Tracking Technology**

Environmental Effect	Proposed PSEGS	Solar PV Alternative
		than PSEGS (PSM)
Potential impacts on groundwater basin balance	PSM	Somewhat less than PSEGS (PSM)
<b>Traffic and Transportation</b>		
Potential damage to roads	PSM	Less than PSEGS (PSM)
Level of service on roads and highways – construction	PSM	Less than PSEGS (PSM)
Level of service on roads and highways – operation/post-construction	LS	Similar to PSEGS (LS)
Solar collector glint and glare impacts on motorists and pilots	PSM	Much less than PSEGS (PSM)
Solar receiver glare impacts that could be hazardous to motorists and pilots	PSM	—
<b>Visual Resources</b>		
<b>Construction-Related Impacts</b>		
Potential for adverse impacts on scenic vistas	SM	Less than PSEGS (SM)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SM	Similar to PSEGS (SM)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	SM	Similar to PSEGS (SM)
<b>Project Operations Impacts</b>		
Potential for adverse impacts on scenic vistas	SU	Less than PSEGS (SU)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SU	Less than PSEGS (SU)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area ( <i>individual effects listed below</i> )		
Glint or glare effects from project structures other than the reflective surfaces of solar collectors (i.e., heliostats, parabolic troughs, PV panels)	SM	Much less than PSEGS (PSM)
Glint or glare effects from the solar collectors	SM	Much less than PSEGS (PSM)
Glint or glare effects from high-profile solar receiver steam generators	SU	—
Light or glare from nighttime lighting effects, including Federal Aviation Administration safety lighting	SM	Less than PSEGS (SM)
<b>Waste Management</b>		
Potential for unexploded ordnance to be present at the project site	PSM	Similar to PSEGS (PSM)

**Alternatives - Table 4**  
**Summary Comparison of Impacts of the Proposed PSEGS to the Solar Photovoltaic Alternative with Single-Axis Tracking Technology**

Environmental Effect	Proposed PSEGS	Solar PV Alternative
Potential for impacts on human health and the environment relating to past or present soil or water contamination	LS	Similar to PSEGS (LS)
Potential for impacts on human health and the environment relating to potential waste discharges	LS	Similar to PSEGS (LS)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	LS	Similar to PSEGS (LS)

(Ex. 2000, pp. 6.1-56 – 6.1-61.)

The analysis contained in the record shows that of the 54 environmental effects analyzed above, the PV alternative would only have two “somewhat greater” impacts compared to the PSEGS. PV’s somewhat greater effects to storm drainage, in our experience, are routinely mitigable. The majority of the environmental effects of PV would be less than those of PSEGS, while the remainder of the environmental effects would be similar to PSEGS, although the PV alternative would still result in several significant unmitigable impacts. As explained more fully in the **BIOLOGICAL RESOURCES** and **CULTURAL RESOURCES** sections of this Decision, the impacts of the modifications proposed in the Petition to Amend the PSEGS project are greater than the PV alternative, which would substantially reduce these impacts. The PV alternative would eliminate the solar flux impacts from the PSEGS.

**Potential to Feasibly Attain Most of the Project Objectives While Avoiding or Substantially Lessening Significant Project Impacts**

The PV alternative could feasibly attain objectives 2, 3, 4, and 6. However, objective 1 (use of existing PPAs), objective 5 (develop a renewable energy facility in a timely manner), objective 7 (develop a solar energy project that contributes diversity to California’s renewable energy supply and readily accommodates thermal energy storage that can shift electricity generation into hours of peak demand), and objective 8 (commence operation before the RPS deadline of December 31, 2020) would not be met.

Ongoing approval and construction of utility-scale PV projects in California and Nevada indicate the suitability of using PV technology for development of a large renewable energy power plant with a capacity of several hundred MWs. It is possible that the PSEGS 3,576-acre solar field area could be used for design and layout of a single-axis tracking PV project to achieve close to the 500-MW capacity of the PSEGS project. Staff suggests that configuring a single-axis tracking PV project has some inherent flexibility, so this alternative could potentially satisfy the project objectives to build in a SEZ and on a site big enough for the solar power towers, while complying with

applicable LORS and avoiding or minimizing significant impacts to the greatest extent feasible. This alternative would satisfy the project objective to develop a renewable energy facility in an area with high solar value and minimal slope. (Ex. 2000, pp. 6.1-55 – 6.1-56.)

However, many other project objectives would not be met by the PV alternative. Petitioner's expert testified that the PPA specifically designates "LPT Power Tower" solar thermal technology as the exclusive means of compliance with and execution of the terms of each PPA. Petitioner states that the CPUC approved the PPA, in part, because this technology represented a means to diversify the renewable energy generation sources on the grid and advance an important alternative generation source. Thus, a change in technology is prohibited by the terms of the PPA barring first counterparty and then CPUC approval. Petitioner concludes that the PV alternative is infeasible because it would have the effect of rendering the project's PPAs void and incapable of being executed. This would effectively negate the main objective of the project. (Ex. 1124, p. 4.)

The Petitioner's expert also testified that the PV alternative is infeasible due to the time, cost, and risks associated with negotiating an amendment to the three-party LGIA. Without timely access to grid interconnection, the project would be incapable of meeting its PPA deadlines. Thus, Petitioner concludes that the PV alternative would be infeasible because its existing interconnection rights would be forfeited. (Ex. 1124, pp. 5-6.) Similarly, Staff testified that a schedule delay could result in a project's failure to meet its milestones and breach the LGIA. (Exs. 1124, pp. 4-6; 2000, p. 6.1-56.)

Compounding these delays is the fact that changing the project technology to solar PV at the PSEGS site would presumably require submittal of a revised POD to the BLM. (Ex. 2000, pp. 6.1-56 – 6.1-57.) As with the PSPP alternative, we conclude that these delays render a PV alternative incapable of being accomplished in a successful manner within a reasonable time period, because it would require embarking on several complex permit applications and contract negotiations that could take five to eight years to complete. (Ex. 1150; 7/30/14 83:4 – 22.) We find that a five- to eight-year delay in this amendment petition is unreasonable, particularly in light of the project objectives.

Petitioner's expert testified that the PPA specifically designates "LPT Power Tower" solar thermal technology as the exclusive means of compliance with and execution of the terms of each PPA. Petitioner argues that the CPUC approved the PPA, in part, because this technology represented a means to diversify the renewable energy generation sources on the grid and advance an important alternative generation source. Thus, a change in technology is prohibited by the terms of the PPA barring first counterparty and then CPUC approval. Petitioner concludes that the PV alternative is infeasible because it would have the effect of rendering the project's PPAs void and incapable of

being executed upon. This would effectively negate the main objective of the project. (Ex. 1124, p. 4.) The Petitioner's expert testified that the PV alternative is infeasible due to the time, cost, and risks associated with negotiating an amendment to the three-party LGIA, as well as the fact that project capacity reduction is incompatible with the terms and deadlines of the PPA and the Petitioner's project objectives. If a change to PV is deemed "material," it would not be permissible without causing the associated project to be removed from the interconnection queue. In this case, PSEGS would be forced to relinquish its priority rights to interconnection and full capacity deliverability status and then reapply for a new queue position. Without timely access to grid interconnection, the project would be incapable of meeting its PPA deadlines. The PV alternative would be infeasible because its existing interconnection rights would be forfeited. (Ex. 1124, pp. 5-6.) Here, again, we find the PV alternative, like the No-project Alternative, could not be successfully accomplished within a reasonable time period.

Further, as to the potential for the PSEGS to add diversity and have the capacity to utilize thermal energy storage, we note that there are a great many PV projects that have already been licensed and are or will be generating electricity. (See Table 3, *supra*.) With respect to thermal energy storage, Petitioner's expert testified that a PV facility could not utilize molten salt storage. (Ex. 1179, p.12.) Evidence indicates that the high temperatures generated by power tower projects allow thermal energy storage performance that is more efficient and cost-effective than trough technologies, which enables the ability to shift generation into periods of higher demand. Thermal energy storage cannot be used with PV at all. (Exs. 1143; 1179, p.12; 7/30/14 RT 50:12-18; 164:7 – 166:21; 167:3-172:19; 208:5-23.)

Again, we must respond to Intervenor CBD's three arguments that there are feasible alternatives to the solar power tower technology, that feasibility is not solely dependent upon Petitioner's subjective assessment, and that economic infeasibility requires a comparison of the costs of the alternatives. (CBD 8/15/14 Opening Brief, pp. 19 - 21.) We agree in general with these points, but note that the Petitioner is not claiming that the trough and PV alternatives are economically infeasible. Instead, Petitioner contends that the alternatives cannot be accomplished within a reasonable time period. (7/30/14 RT 83:4 – 84:8.)

The evidence is uncontroverted that the power tower technology is superior to the PV alternative in terms of thermal storage flexibility, reactive power and voltage support, frequency control, inertia response, controllability, increased solar energy with reduced variability, as well as transmission reliability and utilization benefits. (Ex. 1143.) We see thermal storage as a potentially important component of future energy supply, especially at higher levels of renewable energy. The thermal storage as described by the Petitioner could help form a foundation for the future use of concentrated solar power as

renewable base-load and peaker plants. (7/30/14 RT 171:1 – 174:10; Ex. 1143.) In order to reap the benefits of this emerging technology, it is necessary that we allow its development to iteratively improve. (*Id.*) However, in this instance, the PV alternative would preclude the advancement of this nascent technology, which would run counter to policy favoring a diverse energy supply. In weighing these policies and the evidence presented, we find that although the PV alternative would have significantly fewer significant impacts than the proposed PSEGS amendment, it would not attain most of the project's objectives.

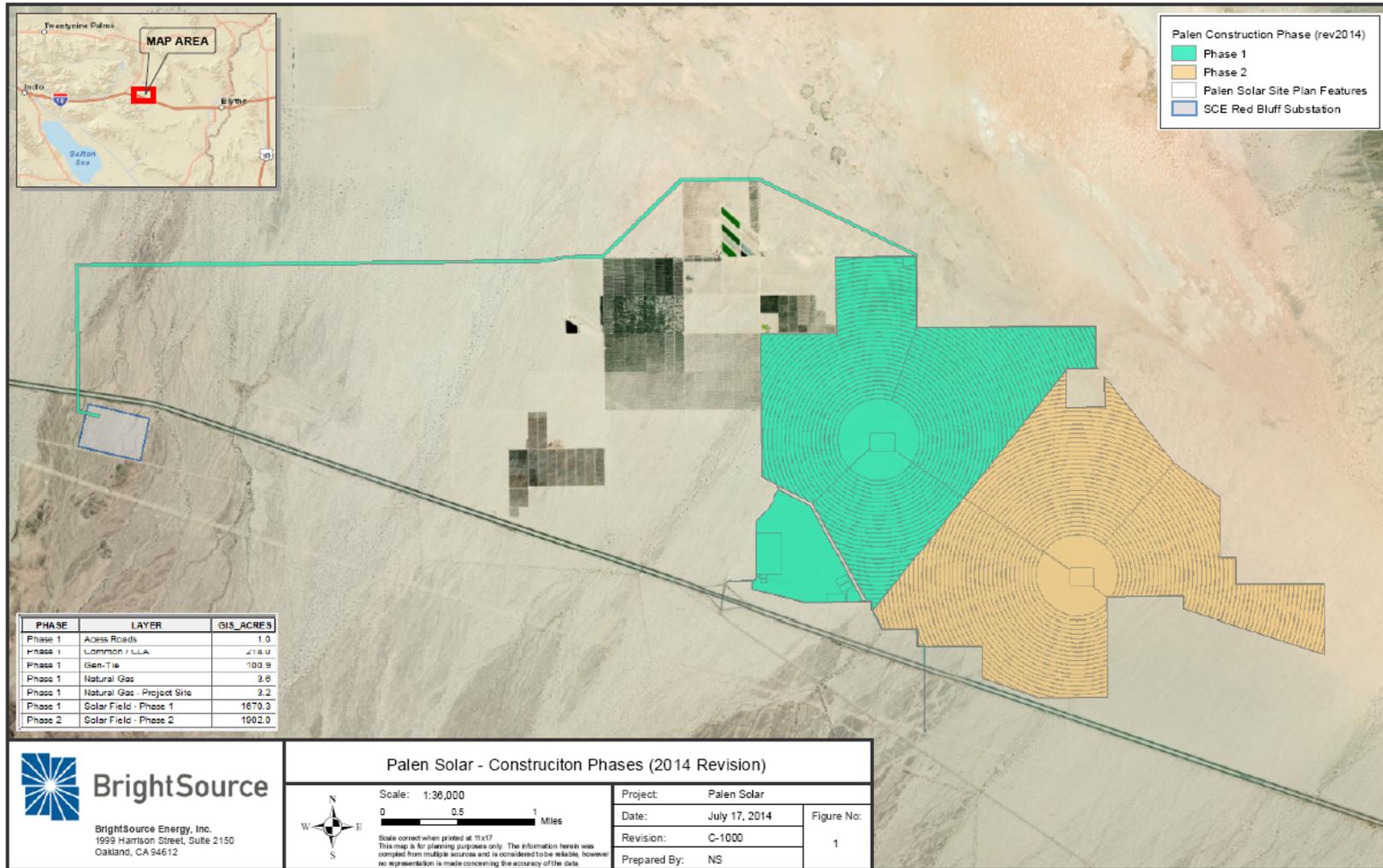
The analysis contained in the record shows the majority of the environmental effects of the PV alternative would be significantly less than those of PSEGS, while the remainder of the environmental effects would be similar to PSEGS. We acknowledge that the PV alternative would eliminate the solar flux impacts from the PSEGS, as well as reduce other significant impacts. Nonetheless, the PV alternative would not feasibly attain most of the project's objectives.

### **Reduced Acreage Alternative with Solar Power Tower Technology**

Description of the Alternative. As shown in Exhibit 1167 below, the Reduced Acreage Alternative with SPT technology (Reduced Acreage Alternative) would involve reducing the total project acreage of the PSEGS project and retain the solar tower unit and heliostat array from PSEGS Unit 1 (the western solar field). The technology for the Reduced Acreage Alternative would be the same as described for the PSEGS. This alternative includes approximately 70 acres from PSEGS Unit 2 (the eastern solar field). The additional acreage would allow a small expansion of the Unit 1 solar field while avoiding an extensive area of desert dry wash woodland habitat in the PSEGS eastern solar field. This alternative would avoid a portion of the sand transport corridor that extends into the northeast portion of the proposed PSEGS solar fields. (Ex. 2000, p. 6.1-75.)

With the addition of acreage from Unit 2, the solar field area for the Reduced Acreage Alternative would cover approximately 1,742 acres. The adjacent 218-acre common area and construction lay-down area adjacent to PSEGS Unit 1 would be retained for an approximate acreage total of 1,960. Like the PSEGS, the generation tie-line would connect at the north side of the heliostat array field. The natural-gas pipeline would require rerouting for this alternative. (Ex. 2000, p. 6.1-76.)

**ALTERNATIVES - Figure 3 - Reduced Acreage Alternative with Solar Power Tower Technology**



Source: Exhibit 1167

## Environmental Analysis

The following is a comparison of the environmental impacts associated with the Reduced Acreage Alternative to those of the PSEGS. **Alternatives - Table 5**, which follows that discussion, presents a summary of that comparison. (Ex. 2000, p. 6.1-77.) The table uses the same nomenclature discussed above for the analysis of the no-project (PSPP) and PV alternatives.

### Air Quality

Staff's analysis of this alternative determined that exhaust emissions from heavy-duty diesel construction equipment and fugitive particulate matter (dust) emissions would be approximately half of the emissions of the proposed modified project due to the reduced number of heliostats and one fewer power tower. Exhaust emissions would also be caused by workers commuting to and from the work sites, trucks hauling equipment and supplies to the sites, and crew trucks (e.g., derrick trucks, bucket trucks, and pickups). With this alternative, the number of workers commuting would be reduced and the duration of the construction during which the workers would be commuting would be reduced by approximately one-half. Exhaust emissions from the worker and delivery vehicles would be half those of the proposed modified project. The total area of site disturbance would be approximately half that of the proposed PSEGS and emissions of particulate matter during construction would be less than PSEGS. However, the comparative reduction in particulate matter would likely be negligible. The construction emissions of this alternative would be somewhat less than PSEGS. No decrease in construction-related emissions would occur with construction of the generation tie-line, which would remain the same length as with the proposed modified project. (Ex. 2000, p. 6.1-81.)

The operational emissions from the Reduced Acreage Alternative would be similar to PSEGS. Appropriate mitigation measures for the Reduced Acreage Alternative would likely involve similar, locally-oriented recommendations such as the conditions of certification presented in the **AIR QUALITY** section of this Decision. This alternative would comply with the South Coast Air Quality Management District rules and regulations. (Ex. 2000, p. 6.1-81.)

The Reduced Acreage Alternative would produce half as much energy as the proposed PSEGS. As with the proposed 500-MW project, a 250-MW project would cause some GHG emissions. However, the 250-MW project would help meet the RPS program goals in California and would result in a net cumulative reduction of energy generation and GHG emissions from new and existing fossil-fuel-fired electricity resources. These system impacts would result in a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, as with the proposed PSEGS, the Reduced Acreage Alternative would result in a cumulative overall reduction in GHG

emissions from power plants. Because this alternative would require the use of auxiliary equipment necessary to operate a solar thermal power plant, the effect of reducing GHG emissions would be similar to PSEGS. (Ex. 2000, pp. 6.1-81 – 6.1-82.)

### **Biological Resources**

Staff testified that this alternative would reduce the total project acreage to approximately 1,960 acres, which would include the 218-acre common area/construction lay-down area. This alternative was developed by retaining the solar tower unit and heliostat array from PSEGS Unit 1 (the western solar field), and would include approximately 70 acres from PSEGS Unit 2 (the eastern solar plant). A total of three special-status plant species are known to be located on the proposed modified project site, which would require mitigation to reduce the impacts to less than significant. The three plant species are ribbed cryptantha (*Cryptantha costata*), Harwood's milkvetch (*Astragalus insularis var. harwoodii*), and California ditaxis (*Ditaxis serrata var. californica*). This alternative would avoid all impacts on mapped populations of ribbed cryptantha, and eliminate impacts on one mapped population of Harwood's milkvetch. Impacts on California ditaxis would be unchanged as they occur along the generation tie-line. The Reduced Acreage Alternative would, therefore, reduce impacts on two rare plant species identified at the project site, and these impacts would be much less than PSEGS. (Ex. 2000, p. 6.1-82.)

Jurisdictional waters of the state enter the project site from the south, fanning out across the alluvium. The Reduced Acreage Alternative would reduce impacts on on-site vegetation, including waters of the state, desert dry wash woodland, and unvegetated ephemeral dry washes. Impacts on these habitats of special concern would be much less than PSEGS. This alternative would also cause direct impacts on aeolian sand corridors Zone II and Zone III that would be less than PSEGS. Impacts to Mojave Fringe-toed Lizard would also likely be less than PSEGS; however, uncertainty exists as to the extent to which impacts would be reduced. (Ex. 2000, p. 6.1-82.)

Terrestrial wildlife on the site varies from the highly mobile Kit Fox and American Badger, to the relatively stationary Desert Tortoise. Surveys for these species were conducted in 2009, 2010, and 2013 during surveys for the generation tie-line. Elimination of the Unit 2 (eastern) power tower and heliostat field would likely reduce impacts on Kit Fox, Desert Tortoise, and American Badger foraging habitat and burrows or burrow complexes. The Burrowing Owl, a state species of special concern, has been documented within the Unit 2 area, but not the Unit 1 area. Given that several years have passed since on-site surveys for Burrowing Owl were conducted, Staff is unclear as to the current distribution and population of Burrowing Owl on site, but regardless, the Reduced Acreage Alternative would reduce impacts on habitat that is suitable for

Burrowing Owl and, therefore, impacts on this species under this alternative would be much less than PSEGS. (Ex. 2000, pp. 6.1-82 – 6.1-83.)

The Reduced Acreage Alternative would eliminate one solar power tower and its associated heliostat field. Similar to the proposed modified project, the structures associated with this alternative could attract birds. It is unknown the extent to which eliminating one solar field would reduce the potential for collisions with project features. By the same reasoning, it is unknown the extent to which eliminating one solar field would reduce the potential for exposure to concentrated solar flux. Staff concluded that impacts on avian species would be less than PSEGS, to an unquantifiable degree, with elimination of one of the two solar fields. Potential impacts on the groundwater basin would be somewhat less than the PSEGS; therefore, the impacts on groundwater dependent vegetation and associated plant and wildlife species would also be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-83.)

### Cultural Resources

Construction and operation of the Reduced Acreage Alternative would reduce the extent of ground disturbance at the project site. Because the overall vertical profile of the Reduced Acreage Alternative compared to the proposed PSEGS would remain essentially the same, this alternative would produce a similar level of visual intrusion on resources *beyond* the facility site. Staff characterized the net effect of this alternative on historical resources as similar to the PSEGS. (Ex. 2000, p. 6.1-83.)

### Fire Protection

#### ***Construction-Related Impacts***

Compared to the proposed PSEGS, construction of the Reduced Acreage Alternative would require approximately the same level of service from the RCFD, and impacts on the RCFD would be approximately the same as the PSEGS. (Ex. 2000, p. 6.1-83.)

#### ***Project Operations Impacts***

Fire protection associated with the Reduced Acreage Alternative would essentially be the same as PSEGS. While there would be lower volumes of hazardous materials on the site and one less power tower with its power block and solar field, and thus less of a need for hazardous materials spill and rescue response, the differences would result in negligible differences in impacts. (Ex. 2000, p. 6.1-83.)

### Geology and Paleontology

The Reduced Acreage Alternative would reduce the total project acreage of the proposed modified project and involve building the solar tower unit and heliostat array for PSEGS Unit 1 (the western solar field). (Ex. 2000, p. 6.1-83.)

Because the ground disturbance from the Reduced Acreage Alternative would be approximately one-half of that associated with the proposed PSEGS, potential impacts on paleontological resources would be correspondingly reduced and are considered less than PSEGS. Because one less SPT would be erected on the site, potential impacts on the facility from geologic hazards (i.e., impacts from strong seismic shaking) would be somewhat less than the PSEGS. No changes to the proposed mitigation measures would be required. (Ex. 2000, p. 6.1-84.)

### Hazardous Materials Management

#### ***Construction-Related Impacts***

As discussed above, the construction phases of any large-scale desert solar project would require the use of various hazardous materials posing similar on-site risks of spillage or other releases. For the Reduced Acreage Alternative, construction-related hazardous materials impacts would be similar to the PSEGS. (Ex. 2000, p. 6.1-84.)

#### ***Project Operations Impacts***

Hazardous materials use associated with the Reduced Acreage Alternative would be essentially the same as the PSEGS. While there would be lower volumes of hazardous materials on the site due to the elimination of one power tower and its power block and solar field, the differences in impacts would be negligible. (Ex. 2000, p. 6.1-84.)

### Land Use

The Reduced Acreage Alternative would reduce the total project acreage to approximately 1,960 acres and retain the solar tower unit and heliostat array from PSEGS Unit 1 (the western solar field). The technology for this alternative would be the same as described for the PSEGS. The Reduced Acreage Alternative would provide benefits compared to the PSEGS (e.g., reduced impacts on terrestrial species and habitats). (Ex. 2000, p. 6.1-84.)

The project area is in the BLM's "Multiple-Use Class M" land use category, which allows construction and operation of electrical generation plants. The PSEGS site is encompassed by the BLM's Riverside East SEZ. These designations also apply to the Reduced Acreage Alternative. Like the PSEGS project, this alternative includes no private land, and no part of the site would be subject to Riverside County's jurisdictional authority. (Ex. 2000, p. 6.1-84.)

Should the BLM approve issuance of a ROW grant for the PSEGS, two CDCA Plan amendments would be required. One would allow the solar generation facility and the other would allow the generation tie-line outside of the designated corridor. Condition of Certification **LAND-1** for the PSEGS requires the project owner to provide documentation of the approved BLM ROW grant and a project-specific amendment to

the CDCA Plan prior to the start of construction. Condition of Certification **LAND-1** would also apply to the Reduced Acreage Alternative. Like the proposed PSEGS, construction and operation of this alternative would require compliance with applicable federal land use LORS. Land use impacts of the Reduced Acreage Alternative would be similar to the PSEGS. (Ex. 2000, pp. 6.1-84 – 6.1-85.)

#### Public Health

##### ***Construction-Related Impacts***

Although the technologies are the same for both the Reduced Acreage Alternative and the proposed PSEGS, the amounts of construction-related emissions and impacts of this alternative would be approximately half that of the proposed PSEGS since the project footprint would be decreased from approximately 3,794 acres to approximately 1,742 acres (not including the 218-acre common area/construction lay-down area). Public health impacts for this alternative would be less than PSEGS. Like the proposed PSEGS, no significant impacts would occur, and no mitigation measures would be required for construction-related emissions.

##### ***Project Operations Impacts***

Since the technologies are the same for both the Reduced Acreage Alternative and the proposed PSEGS, project operations emissions would be the same per unit of capacity. However, the amounts of emissions and impacts from operation of this alternative would be approximately half that of the PSEGS due to the reduced number of boilers and extent of mirror washing. For the Reduced Acreage Alternative, the potential for exposure to *Legionella* would remain with operation of the WSAC units at Power Block 1 of the western solar field. For PSEGS, the impact is reduced to less than significant with implementation of Condition of Certification **PUBLIC HEALTH-1**. The same mitigation measure would apply to this alternative. Overall, the operational emissions from the Reduced Acreage Alternative would be less than the PSEGS. (Ex. 2000, p. 6.1-85.)

#### *Socioeconomics*

This alternative proposes one solar power tower, compared with the two solar power towers proposed for the PSEGS. Staff concluded that construction and operation of the PSEGS would not cause significant adverse direct or indirect socioeconomic impacts on public services. With the reduction of the equipment installed for this alternative, the workforce for project construction and operations would be smaller overall and the duration of construction would be shorter. Given the smaller construction and operations workforces required and shorter construction schedule, the socioeconomic impacts for this alternative would be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-85.)

Construction and project operation of this alternative would generate employment income and associated state and local sales taxes that would be somewhat less than the PSEGS. Like PSEGS, this alternative is on federal land; therefore, section 17620 of the Education Code (school impact fees) would not apply and no property taxes would be paid. The economic benefits of this alternative would be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-85 – 6.1-86.)

### Soil and Water Resources

The Reduced Acreage Alternative would involve reducing the total project site acreage and effectively only building the solar tower unit and heliostat array for PSEGS Unit 1 (the western solar field). (Exs. 1167; 2000, p. 6.1-86.)

Because the footprint for the Reduced Acreage Alternative would decrease to roughly half that of the PSEGS, impacts relating to soil erosion during construction (grading of roadways and power plant construction), and operations (heliostat washing and vegetation maintenance) would be less than the PSEGS. Operation of one power plant compared to two would decrease the volume of processed wastewater and contamination of storm water runoff; therefore, these impacts would be less than the PSEGS. The amount of domestic sanitary waste disposed in septic systems would decrease; therefore, these impacts would be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-86.)

Because at least half of the off-site flows pass through the PSEGS Solar Unit 1, impacts from flood flows and flooding for the Reduced Acreage Alternative would be less than the PSEGS. Also, by avoiding storm damage impacts in the Solar Unit 2 solar field, the overall impacts of storm water damage for the Reduced Acreage Alternative would be less than the PSEGS. Impacts from 100-year flood flows (as shown on FEMA maps) do not apply because the published maps show that the 100-year flood plain is not present at or near the proposed site. (Ex. 2000, p. 6.1-86.)

The Reduced Acreage Alternative would require less operational water use for process and heliostat washing compared to the proposed PSEGS project. Assuming installation of approximately half the total number of heliostats compared to PSEGS, operational water use could be reduced up to half of the total amount under this alternative. For purposes of impact analysis, it is assumed that any withdrawals exceeding the average natural recharge and exceeding a significant percentage of the total amount of groundwater in storage would cause a significant impact. Because the Chuckwalla Valley Groundwater Basin (CVGB) is estimated to have a positive groundwater balance of approximately 2,600 AFY, neither the PSEGS nor the Reduced Acreage Alternative would result in basin overdraft. And, although the water use for this alternative would be about 3,580 acre feet less than for the PSEGS, total water use by the PSEGS or this alternative would be very small compared to the CVGB's storage capacity of 15,000,000

AFY. Both the PSEGS and this alternative would reduce the amount of total stored groundwater by less than a tenth of one percent; therefore, potential impacts of the Reduced Acreage Alternative on the CVGB and local well owners would generally be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-86.)

### Traffic and Transportation

#### ***Potential Damage to Roads***

This alternative would result in a smaller project to develop, therefore requiring fewer construction workers and a shorter construction period. However, heavy haul trucks that could damage roads would be used for both this alternative and the PSEGS. For these reasons, road damage could occur but would be somewhat less than PSEGS. Mitigation measures similar to those recommended for the modified project would reduce potential damage impacts on roadways to less-than-significant levels. (Ex. 2000, p. 6.1-87.)

The Reduced Acreage Alternative would be smaller than the proposed PSEGS and would probably require fewer employees to operate. However, for both the Reduced Acreage Alternative and the proposed PSEGS project, the minimal number of trips generated by operations employees would have a negligible impact on traffic LOS. Therefore, impacts would be similar to the PSEGS. No mitigation measures would be required. (Ex. 2000, p. 6.1-87.)

#### ***Solar Collector Glint and Glare Impacts on Motorists and Pilots***

This alternative would involve installation of approximately half the number of heliostats required for the proposed PSEGS. Also, by omitting most of Unit 2 (the eastern solar plant), this alternative would eliminate many of the heliostats that would be located closest to I-10. For these reasons, glint and glare impacts on motorists and pilots would be less than the PSEGS. Mitigation measures similar to those recommended for the proposed modified project would reduce potential nuisance effects from glint and glare to less than significant. (Ex. 2000, p. 6.1-87.)

#### ***Solar Receiver Glare Impacts that Could Be Hazardous to Motorists and Pilots***

This alternative involves construction of one solar power tower instead of two; therefore, glare impacts on motorists and pilots from the SRSG would be somewhat less than the PSEGS. However, like the proposed modified project, the potential for glare from the SRSG to cause hazardous operating conditions for motorists and pilots would be potentially significant, and implementation of appropriate mitigation measures (e.g., a solar power tower luminance monitoring plan) would be required to reduce this impact to less than significant. (Ex. 2000, p. 6.1-87.)

## Visual Resources

The Reduced Acreage Alternative would, like the proposed PSEGS, deploy a field of heliostats aimed at a solar power tower, but would be approximately half the acreage of the PSEGS with one rather than two solar towers. This alternative, like the PSEGS, would include a power transmission line from the project site to the Red Bluff Substation. (Ex. 2000, p. 6.1-88.)

### ***Potential for Adverse Impacts on Scenic Vistas***

Construction-Related Impacts: Construction of the Reduced Acreage Alternative would cause temporary visual impacts due to the presence of equipment, materials, and a workforce at the project site and along the transmission line route, an increase in visible traffic along I-10 and access roads, and large dust clouds generated by grading activities. The type of construction would be similar to the PSEGS, but the area of disturbance would be smaller and the construction period would be shorter. Construction impacts of this alternative on scenic vistas would thus be less than PSEGS. (Ex. 2000, p. 6.1-88.)

Project Operations Impacts: No designated scenic vistas were identified in the PSEGS study area, but panoramic and highly scenic vistas from the Palen McCoy Wilderness and Chuckwalla Mountains Wilderness would be affected by this alternative. The Reduced Acreage Alternative would be smaller, but have similar industrial characteristics when viewed from the two wilderness areas. The predominant visual impact of the Reduced Acreage Alternative would result from the extremely bright glare of the single solar receiver. This alternative would be prominently visible from both wilderness areas and the introduction of industrial characteristics, structural visual contrast, and extremely bright glare would result in substantial adverse effects on these vistas. Although the overall affected area of visibility could be somewhat less under the Reduced Acreage Alternative compared to PSEGS, the probable difference in the extent of the viewshed would be comparatively minor and would not reduce potential impacts on the wilderness areas to a less-than-significant level. The impact on scenic vistas would be somewhat less than the PSEGS, but would be a significant and unavoidable impact of this alternative. (Ex. 2000, p. 6.1-88.)

### ***Potential to Substantially Damage Scenic Resources within a State Scenic Highway***

The PSEGS site is located adjacent to the north side of I-10, which is not listed as an eligible State Scenic Highway, and no notable scenic features or historic structures are located within the site. Therefore, construction of the Reduced Acreage Alternative would not substantially damage scenic resources within a state scenic highway. This impact would be similar to the PSEGS. The impact of operation of the Reduced

Acreage Alternative on scenic resources within a state scenic highway would be similar to the PSEGS. (Ex. 2000, p. 6.1-88.)

***Potential to Substantially Degrade the Existing Visual Character or Quality of the Site and its Surroundings***

The type of construction of the Reduced Acreage Alternative would be similar to the proposed PSEGS, but the area of disturbance would be smaller and the construction period would be shorter. Therefore, construction impacts of this alternative on visual quality would thus be less than the PSEGS. (Ex. 2000, p. 6.1-89.)

During operations, the Reduced Acreage Alternative would introduce prominent structures with industrial characteristics into the views from SR 177, the Desert Center area, I-10, Corn Springs Road, nearby wilderness areas, Joshua Tree National Park, and a few nearby residences. This alternative would be substantially smaller in area than the proposed PSEGS, but would include a solar tower generating strong glare that would be prominently visible and have strong visual effects over substantially the same viewshed as with the PSEGS. This glare effect would be less intense than with the PSEGS, but would remain considerable. The area of desert floor affected as seen from elevated Wilderness Area viewpoints would be reduced; therefore, the strong form and color contrast from the mirrored heliostat fields would affect a smaller portion of the Wilderness Areas. However, the strong glare effects would extend roughly over the same area as with the proposed PSEGS. Due to the smaller area (approximately 1,960 acres, including the common area) and single solar tower of the Reduced Acreage Alternative, the impact on visual quality would thus be somewhat lesser than the PSEGS, but this alternative would still result in a substantial degradation of the existing visual quality of the site and its surroundings. (Ex. 2000, p. 6.1-89.)

***Potential to Create a New Source of Substantial Light or Glare that Would Adversely Affect Daytime or Nighttime Views in the Area***

Some construction activity could take place at night during construction of the Reduced Acreage Alternative, with lighting impacts that would extend over a much smaller area and, thus, be less than the PSEGS. (Ex. 2000, p. 6.1-89.)

During operations, non-mirrored surfaces of the facilities of the Reduced Acreage Alternative have the potential to introduce reflected glare into the visual environment if the structures were light colored or included unpainted metal components, and this impact would be similar to the PSEGS. Like the proposed modified project, with the effective implementation of Condition of Certification **VIS-1**, the Reduced Acreage Alternative would not cause excessive glare from non-mirrored surfaces (e.g., metallic or painted structures). (Ex. 2000, p. 6.1-89.)

Glint effects, that is, inadvertent very bright reflections of the sun's image off the heliostats under certain conditions, could present a disruptive visual distraction for motorists and other viewers, which would represent a significant glare impact of the Reduced Acreage Alternative due to the potential intensity of the effect. This glint impact would be similar to the PSEGS. With implementation of proposed Condition of Certification **TRANS-7**, stray glint impacts from solar reflection off of the heliostats, under the Reduced Acreage Alternative, would be reduced to a less-than-significant level. (Ex. 2000, p. 6.1-89.)

The Reduced Acreage Alternative would generate strong on-going operational glare that would affect substantially the same viewshed as the proposed PSEGS. Although the overall affected area of visibility could be somewhat less under the Reduced Acreage Alternative as compared to PSEGS, the difference in the extent of the viewshed would be comparatively minor and would not reduce potential impacts on the wilderness areas to a less-than-significant level. The impact of the Reduced Acreage Alternative due to glare from solar receivers would, thus, be somewhat less than the PSEGS, but the glare impact would remain significant and unavoidable for this alternative. (Ex. 2000, p. 6.1-90.)

The Reduced Acreage Alternative could generate nighttime light pollution from its operational lighting, but because there would be only one power block rather than two, this impact would be somewhat less than the PSEGS. As with the proposed modified project, the effective implementation of Condition of Certification **VIS-4** would reduce the Reduced Acreage Alternative's off-site, operation-related lighting impacts to less than significant. The Reduced Acreage Alternative would have a solar tower that would require FAA safety lighting, and this impact would be similar to the PSEGS. (Ex. 2000, p. 6.1-90.)

### Waste Management

Staff testified that the Reduced Acreage Alternative would result in less construction and operation waste. Potential impacts on disposal or diversion facilities would be less than the PSEGS. The location of the SPT for PSEGS Unit 1 would be the same as the proposed PSEGS project. Similar to the proposed modified project, we would require investigation and remediation of soil and groundwater contamination if it was encountered during construction and operation of this alternative. Site characterization and remediation requirements would remain the same as for the proposed PSEGS. Site worker training for potential unexploded ordnance (UXO) would still be required as would preparation of a UXO Identification, Training, and Reporting Plan. Potential impacts from UXO would be similar to or less than the PSEGS. Although the reduction in acreage would reduce the potential area of exposure to unidentified UXO, it is

unknown where on the site UXO could occur, or if UXO is present on the site at all. (Ex. 2000, p. 6.1-90.)

#### Power Plant Efficiency and Reliability

Staff testified that the operation and performance of the Reduced Acreage Alternative presented above is comparable in efficiency to the proposed project. (Ex. 2000, p. 6.1-92.)

#### Transmission System Engineering

Due to the reduction in power output for the Reduced Acreage Alternative, this alternative could reduce the potential impacts on the downstream transmission system compared to the proposed PSEGS. However, no new or significant impacts would occur to the transmission system from any of the alternatives. No new or different mitigation measures would be required. Therefore, the downstream transmission system impacts would be somewhat less than the PSEGS. (Ex. 2000, p. 6.1-93.)

#### Conclusion

The Reduced Acreage Alternative would lessen most of the impacts identified with the PSEGS. Although, this alternative would not eliminate the significant unmitigable impacts to cultural, biological, or visual resources identified for the PSEGS, the Reduced Acreage Alternative would result in a meaningful reduction of those impacts. It would reduce the number of flux fields from two to one and lessen the effect of the prominent glare on visual and cultural resources. (Exs. 1166, 1167.) Staff commented that the Reduced Acreage Alternative with a single solar power tower would reduce the impacts to biological resources more than it would reduce the impacts to visual or cultural resources. (Ex. 1206.)

**Alternatives – Table 5**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the Reduced Acreage Alternative with SPT Technology**

Environmental Effect	Proposed PSEGS	Reduced Acreage Alternative with SPT Technology
<b>Air Quality</b>		
Construction-related emissions	SM (locally)	Somewhat less than PSEGS (SM)
Project operations emissions	SM (locally)	Similar to PSEGS (SM)
Reduction in greenhouse gases	B (system wide)	Similar to PSEGS (B)
<b>Biological Resources</b>		
Impacts on special-status plant species	SM	Much less than PSEGS (SM)
Impacts on waters of the state	SM	Much less than PSEGS (SM)
Impacts on desert tortoise	SM	Much less than PSEGS (SM)
Impacts on special-status terrestrial wildlife species (kit fox, American badger)	SM	Much less than PSEGS (SM)
Potential impacts on avian species from collisions with project features	PSU	Less than PSEGS (PSU)
Potential impacts on avian species from exposure to concentrated solar flux	PSU	Less than PSEGS (PSU)
Potential impacts on groundwater dependent ecosystems	SM	Somewhat less than PSEGS (SM)
Impacts on sand transport corridor	SM	Less than PSEGS (SM) ( <i>see biological resources note</i> )
Impacts on sand dunes and Mojave Fringe-toed lizard	SM	Less than PSEGS (SM) ( <i>see biological resources note</i> )
<i>Biological resources note: Comparative impacts for the Reduced Acreage Alternative for indirect impacts on the sand transport corridor, sand dune habitat, and Mojave Fringe-toed Lizard cannot reasonably be characterized without further data and use of a sand transport model.</i>		
<b>Cultural Resources</b>		
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>on</i> the facility site, resources recommended or assumed to be historically significant ( <i>see cultural resources note</i> )	PSM	Less than PSEGS (PSM)
Potential to substantively degrade, directly or indirectly, prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Similar to PSEGS (SU)

**Alternatives – Table 5**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the Reduced Acreage Alternative with SPT Technology**

Environmental Effect	Proposed PSEGS	Reduced Acreage Alternative with SPT Technology
Potential for cumulatively considerable degradation of prehistoric or historical archaeological resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Similar to PSEGS (SU)
Potential impacts on significant built-environment cultural resources <i>on</i> the site	LS	Similar to PSEGS (LS)
Potential impacts on a significant built-environment cultural resource (Desert Center) <i>beyond</i> the site	SU	Similar to PSEGS (SU)
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	PSM	Similar to PSEGS (PSM)
Potential for cumulatively considerable degradation of ethnographic resources <i>on</i> the facility site, resources recommended or assumed to be historically significant	LS	Similar to PSEGS (LS)
Potential to substantively degrade, directly or indirectly, ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Similar to PSEGS (SU)
Potential for cumulatively considerable degradation of ethnographic resources <i>beyond</i> the facility site, resources recommended or assumed to be historically significant	SU	Similar to PSEGS (SU)
<i>Cultural resources note:</i> "Site" means the facility site proper and does not include linear or ancillary infrastructure away from the facility site.		
<b>Fire Protection</b>		
<b>Construction-Related Impacts</b>		
Impacts on the Riverside County Fire Department	SM	Same as PSEGS (SM)
<b>Project Operations Impacts</b>		
Become familiar with and plan for emergency responses	SM	Same as PSEGS (SM)
Conduct plan reviews, inspections, and permitting	SM	Same as PSEGS (SM)
Fire response	SM	Same as PSEGS (SM)
Hazardous materials spill response	SM	Same as PSEGS (SM)
Rescue	SM	Same as PSEGS (SM)
Emergency medical services	SM	Same as PSEGS (SM)
<b>Geology and Paleontology</b>		
Potential impacts from strong seismic shaking	SM	Somewhat less than PSEGS (SM)
Potential impacts from soil failure caused by liquefaction, hydrocollapse, and/or dynamic compaction	SM	Somewhat less than PSEGS (SM)
Potential impacts on paleontological resources	SM	Less than PSEGS (SM)
Potential impacts on geological or mineralogical resources	—	—
<b>Hazardous Materials Management</b>		
<b>Construction-Related Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Same as PSEGS (SM)

**Alternatives – Table 5**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the Reduced Acreage Alternative with SPT Technology**

Environmental Effect	Proposed PSEGS	Reduced Acreage Alternative with SPT Technology
Potential for spills or other releases of hazardous materials to occur off-site	LS	Same as PSEGS (LS)
<b>Project Operations Impacts</b>		
Potential for spills or other releases of hazardous materials to occur on-site	SM	Same as PSEGS (SM)
Potential for spills or other releases of hazardous materials to occur off-site	LS	Same as PSEGS (LS)
<b>Land Use</b>		
Compatibility with land use plan, policy, or regulation	SM	Similar to PSEGS (SM)
<b>Public Health</b>		
Potential for project construction to cause air toxics-related or other impacts that could affect public health	LS	Less than PSEGS (LS)
Potential for project operations to cause air toxics-related or other impacts that could affect public health	PSM	Less than PSEGS (PSM)
<b>Socioeconomics</b>		
Environmental justice population within 6-mile buffer.	—	—
Induce substantial population growth in an area, either directly or indirectly.	LS	Somewhat less than PSEGS (LS)
Displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere.	LS	Somewhat less than PSEGS (LS)
Adversely impact acceptable levels of service for police protection, schools, and parks and recreation.	LS	Somewhat less than PSEGS (LS)
Increased property taxes, construction and operation employment income, and increased state and local taxes and fees.	B	Somewhat less than PSEGS (B)
<b>Soil and Water Resources</b>		
Soil erosion by wind and water during project construction	SM	Less than PSEGS (SM)
Soil erosion by wind and water during project operations	PSM	Less than PSEGS (PSM)
Water quality impacts from contaminated storm water runoff	SM	Less than PSEGS (SM)
Water quality impacts from storm damage	PSM	Less than PSEGS (PSM)
Water quality impacts from power plant operations	SM	Less than PSEGS (SM)
Water quality impacts from sanitary waste	SM	Somewhat less than PSEGS (SM)
Potential impacts from on-site and off-site flooding	PSM	Less than PSEGS (PSM)
Potential to impede or redirect 100-year flood flows, as shown on Federal Emergency Management Agency maps	—	—
Potential impacts on local wells	PSM	Somewhat less than PSEGS (PSM)
Potential impacts on groundwater basin balance	PSM	Somewhat less than

**Alternatives – Table 5**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the Reduced Acreage Alternative with SPT Technology**

Environmental Effect	Proposed PSEGS	Reduced Acreage Alternative with SPT Technology
		PSEGS (PSM)
<b>Traffic and Transportation</b>		
Potential damage to roads	PSM	Somewhat less than PSEGS (PSM)
Level of service on roads and highways – construction	PSM	Less than PSEGS (PSM)
Level of service on roads and highways – operation/post-construction	LS	Similar to PSEGS (LS)
Solar collector glint and glare impacts on motorists and pilots	PSM	Less than PSEGS (PSM)
Solar receiver glare impacts that could be hazardous to motorists and pilots	PSM	Somewhat less than PSEGS (PSM)
<b>Visual Resources</b>		
<b>Construction-Related Impacts</b>		
Potential for adverse impacts on scenic vistas	SM	Less than PSEGS (SM)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SM	Less than PSEGS (SM)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area	SM	Less than PSEGS (SM)
<b>Project Operations Impacts</b>		
Potential for adverse impacts on scenic vistas	SU	Somewhat less than PSEGS (SU)
Potential to substantially damage scenic resources within a state scenic highway	LS	Similar to PSEGS (LS)
Potential to substantially degrade the existing visual character or quality of the site and its surroundings	SU	Somewhat less than PSEGS (SU)
Potential to create a new source of substantial light or glare which would adversely affect day or nighttime views in the area (individual effects listed below)		
Glint or glare effects from project structures other than the reflective surfaces of solar collectors (i.e., heliostats, parabolic troughs, PV panels)	SM	Similar to PSEGS (SM)
Glint or glare effects from the solar collectors	SM	Similar to PSEGS (SM)
Glint or glare effects from high-profile solar receiver steam generators	SU	Somewhat less than PSEGS (SU)
Light or glare from nighttime lighting effects, including Federal Aviation Administration safety lighting	SM	Somewhat less than PSEGS (SM)
<b>Waste Management</b>		
Potential for unexploded ordnance to be present at the project site	PSM	Similar to or less than PSEGS (PSM)

**Alternatives – Table 5**  
**Summary Comparison of Impacts of the Proposed PSEGS**  
**to the Reduced Acreage Alternative with SPT Technology**

Environmental Effect	Proposed PSEGS	Reduced Acreage Alternative with SPT Technology
Potential for impacts on human health and the environment relating to past or present soil or water contamination	LS	Similar to or less than PSEGS (LS)
Potential for impacts on human health and the environment relating to potential waste discharges	LS	Similar to or less than PSEGS (LS)
Potential for disposal or diversion of project materials to cause impacts on existing waste disposal or diversion facilities	LS	Less than PSEGS (LS)

Potential to Feasibly Attain Most of the Project Objectives while Avoiding or Substantially Lessening Significant Project Impacts

We conclude that the Reduced Acreage Alternative could feasibly attain all objectives except objective 1 (deliver 500 MW to the regional grid pursuant to an approved PPA). The Reduced Acreage Alternative would deliver 250 MW pursuant to the only PPA for this project that is likely viable. (Ex. 1151, p.2.) Development of an approximately 250-MW SPT project at the PSEGS site would satisfy most of the project objectives to construct and operate a utility-scale solar energy project and assist SCE in satisfying its RPS program goals; however, the total proposed 500-MW capacity would not be achieved. This alternative could potentially satisfy the project objective to develop a solar thermal power plant at a site where some authorizations for construction have been obtained, although the licensed site would not be fully used to produce renewable energy. This alternative does not propose another use for the remainder of the site (the eastern solar field) should it not be developed for the proposed PSEGS. This alternative would satisfy the project objective to develop a site that is in a BLM-designated SEZ. (Ex. 2000, p. 6.1-76.)

The Reduced Acreage Alternative would satisfy the project objective to meet permitting requirements and comply with applicable LORS. This alternative would satisfy the project objective to develop a renewable energy facility in an area with high solar value and minimal slope. (Ex. 2000, p. 6.1-76.)

Environmental impacts on some resources would be reduced under this alternative compared to the PSEGS project, particularly when there is a direct correlation between project acreage and the extent of the impact. This alternative could meet the project objective to avoid or minimize significant impacts to the greatest extent feasible. Because all existing entitlements could be used, the Reduced Acreage Alternative could

be built in time to meet RPS goals and would also retain the capability of the PSEGS to add thermal energy storage. (7/30/14 RT 50:12-18.) We therefore find that the Reduced Acreage Alternative would meet virtually all of the PSEGS project objectives while substantially lessening the significant adverse impacts of the PSEGS.

## **PUBLIC COMMENT**

**Joan Taylor** spoke about several alternatives. “[F]rom a ratepayer standpoint and environmental standpoint, this project really should have storage to be worth the cost.” I heard Whitewater River mentioned as one of the places to mitigate for riparian impacts to this project, but because the Whitewater River is in the Coachella Valley, and there's a problem with mitigating projects outside its local MSHGP.” She questioned Staff's contention that one cannot locate power towers in Central Valley because there are residences there and because there is BrightSource's Coalinga project that is right next to the town of Coalinga. In Lancaster, the power tower is right in town. She asked: “so why couldn't the project be built in the Westlands? There's less residences there than in Lancaster by far.”

**Brendan Hughes** provided written comments on November 13, 2013, indicating that the “No Project” alternative should be selected. He argued that rooftop solar in the built environment was even more effective and would produce more jobs and other benefits.

**Sandy Choudari** submitted comments on November 14, 2013, regarding the adaptability of tortoises, lizards, and birds so that the project is the best alternative, particularly because solar and wind energy are the cleanest energy options.

On November 25, 2013, **Paul Smith** submitted a letter from Tourism Economics Commission stating that, according to the U.S. EPA, alternative energy projects should be placed on degraded and/or contaminated lands, and not in areas such as those proposed for the project that has a thriving ecosystem and economy based on the desert environment. He also spoke to actions by the BLM.

On January 17, 2014, **Mark Butler** of the National Park Service commented that the National Park Service supports parabolic trough or photovoltaic for this location as superior alternatives.

On January 8, 2014, **Sarah Friedman** of the Sierra Club commented that the alternatives would achieve the same benefits in a much more environmentally protective manner.

On April 1, 2014, **Mike Ferry** from the California Center for Sustainable Energy commented that he preferred storage via an aggregated fleet of plug-in electric vehicles.

On April 7, 2014, **V. John White** commented that he supported the PSEGS, which offers mechanical inertia, voltage support, reliability, and jobs in a Solar Energy Zone.

On May 5, 2014, **Garry George** from Audubon, California, commented that trough was a superior alternative.

On June 5, 2014, **Kurtis Engle** commented that the PSEGS solar flux would be a deathtrap for birds. He recommended using the photovoltaic alternative.

On July 29, 2014, **Tom Budlong** commented that the PV alternative seemed a superior alternative to the power tower.

The issues raised by these comments are addressed above in this section, as well as in the **BIOLOGICAL RESOURCES** section of this Decision.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. California needs renewable energy sources to meet the 33 percent 2020 Renewable Portfolio Standard.
2. The State of California is best served by a diverse portfolio of renewable energy sources with technologies that can readily accommodate thermal energy storage.
3. The ability to add thermal energy storage that can extend electricity generation into hours of peak demand is an important benefit of this project.
4. The PSEGS project would meet each project objective, except that PSEGS apparently lacks viable PPAs for the entire output of the facility.
5. The PSEGS project would create significant direct and cumulative impacts to visual, cultural, and biological resources.
6. Alternatives to the PSEGS include the no-project, solar trough, photovoltaic, and reduced acreage solar power tower.
7. Staff's elimination of the 500-MW Solar Power Tower (SPT) with Lower Tower Height Alternative and an SPT with Energy Storage Alternative alternatives from analysis is reasonable.
8. There is no identified off-site location that would avoid or substantially lessen any of the significant effects of the PSEGS project.
9. There are no identified feasible alternative locations for the PSEGS where site control and use could be obtained in a reasonable time frame.
10. DG is complimentary to renewable power generation, rather than alternative to it, is not a feasible alternative to the PSEGS, and does not attain the basic project objectives.

11. Energy efficiency is complimentary to meeting the state's energy policy and goals, rather than an alternative to renewable energy generation, is not a feasible alternative to the PSEGS, and does not attain most of the basic project objectives.
12. The PSPP would have lesser impacts to visual resources and cultural resources than the PSEGS (although they would still remain significant after imposition of mitigation) and would avoid significant adverse impacts to biological resources.
13. The PSPP would not satisfy most of the project's objectives.
14. The PSPP is an infeasible alternative because is incapable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.
15. The PV alternative would have fewer environmental impacts than the PSEGS.
16. The PV alternative would not satisfy most of the project objectives.
17. The PV alternative is an infeasible alternative because is incapable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors.
18. The Reduced Acreage Alternative would attain all but the first of the project's objectives.
19. Although the Reduced Acreage Alternative would create significant unmitigable impacts in the areas of cultural resources, biological resources and visual resources, the impacts are significantly less than those that would be created by the PSEGS.
20. The Reduced Acreage Alternative is feasible.

## **CONCLUSIONS OF LAW**

1. The Reduced Acreage Alternative feasibly attains most of the basic project objectives while substantially lessening the PSEGS significant environmental impacts.

### **III. COMPLIANCE AND CLOSURE**

Public Resources Code, section 25532, requires the Commission to establish a post-certification monitoring system. The purpose of this requirement is to assure that certified facilities are constructed and operated in compliance with applicable laws, ordinances, regulations, and standards (LORS), as well as the specific conditions of certification adopted as part of this Decision.

#### **SUMMARY OF THE EVIDENCE**

The evidence of record contains a full explanation of the purposes and intent of the Compliance Plan (Plan). The Plan is the administrative mechanism used to ensure that the Palen Solar Electric Generating System (PSEGS) is constructed and operated according to the conditions of certification. It essentially describes the respective duties and expectations of the project owner and the Staff Compliance Project Manager (CPM) in implementing the design, construction, and operation criteria set forth in this Decision. The following evidence on compliance and closure was received into evidence on October 29, 2013: Exhibits 1001, 1002, 1041, 1057, 1076, 2000, 2002, 2003, and 2008. (10/29/13 RT 17:24 – 21:13.)

Compliance with the Conditions of Certification contained in this Decision is verified through mechanisms such as periodic reports and site visits. The Plan also contains requirements governing the planned closure, as well as the unexpected temporary and unexpected permanent closure, of the project.

The Plan will also be integrated with a U.S. Bureau of Land Management (BLM) Compliance Monitoring Plan (hereafter referred to as the "Compliance Plan") to assure compliance with the terms and conditions of any approved Right-of-Way (ROW) grant including the approved Plan of Development (POD).

Additionally, the conditions of certification referred to herein serve the purpose of both the Energy Commission's conditions of certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

The Plan is composed of two broad elements. The first element establishes the "general conditions" that:

- Set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner or operator (project owner), delegate agencies, and others;

- Set forth the requirements for handling confidential records and maintaining the compliance record;
- State procedures for settling disputes and making post-certification changes;
- State the requirements for periodic compliance reports and other administrative procedures necessary to verify the compliance status of all Energy Commission-approved conditions of certification;
- Establish contingency planning, facility non-operation protocols, and closure requirements; and
- Establish a tracking method for the technical area conditions of certification that contain measures required to mitigate potentially adverse project impacts associated with construction, operation, and closure to less than a level of significance. Each technical condition of certification also includes one or more verification provisions that describe the means of assuring that the condition has been satisfied. (Ex. 2000, p. 7-1.)

The second general element of the Plan contains the specific “conditions of certification.” These are found following the summary and discussion of each individual topic area in this Decision. The individual conditions contain the measures required to mitigate potentially adverse project impacts associated with construction, operation, and closure to levels of insignificance. Each condition also includes a verification provision describing the method of assuring that the condition has been satisfied.

The contents of the Plan are intended to be implemented in conjunction with any additional requirements contained in the individual conditions of certification.

## **FINDINGS OF FACT**

We adopt the following Plan as part of this Decision.

As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

The compliance and monitoring provisions incorporated as a part of this Decision satisfy the requirements of Public Resources Code, section 25532.

The Plan and the specific conditions of certification contained in this Decision assure that the PSEGS will be designed, constructed, operated, and closed in conformity with applicable law.

## **KEY PROJECT DEFINITIONS**

The following terms and definitions help determine when various conditions of certification are implemented.

### **Project Certification**

Project certification occurs on the day the Energy Commission docket its Decision after adopting it at a publically-noticed business meeting or hearing. At that time, all Energy Commission conditions of certification become binding on the project owner and the proposed facility. (Ex. 2000, p.7-2.)

### **Site Assessment and Pre-Construction Activities**

The below-listed site assessment and pre-construction activities may be initiated or completed prior to the start of construction, subject to the CPM's approval of the specific site assessment or pre-construction activities.

Site assessment and pre-construction activities include the following, but only to the extent the activities are minimally disruptive to soil and vegetation and will not affect listed or special-status species or other sensitive resources:

1. The installation of environmental monitoring equipment;
2. A minimally invasive soil or geological investigation;
3. A topographical survey;
4. Any other study or investigation such as preconstruction surveys and tortoise clearance work determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. Any minimally invasive work to provide safe access to the site for any of the purposes specified in 1-4 above. (Ex. 2000, p.7-2.)

### **Site Mobilization and Construction**

When a Condition of Certification requires the project owner to take an action or obtain CPM approval prior to the start of construction or within a period of time relative to the start of construction, that action must be taken or approval must be obtained prior to any site mobilization or construction activities, as defined below. (Ex. 2000, p.7-2.)

Site mobilization and construction activities are those necessary to provide site access for construction mobilization and facility installation, including both temporary and permanent equipment and structures, as determined by the CPM.

Site mobilization and construction activities include, but are not limited to:

1. Ground disturbance activities like grading, boring, trenching, leveling, mechanical clearing, mowing, grubbing, and scraping;
2. Site preparation activities, such as access roads, temporary fencing, trailer and utility installation, construction equipment installation and storage, equipment and supply laydown areas, borrow and fill sites, temporary parking facilities, and chemical spraying and controlled burns; and
3. Permanent installation activities for all facility and linear structures, including access roads, fencing (including tortoise fencing), utilities, parking facilities, equipment storage, mitigation and landscaping activities, and other installations as applicable. (Ex. 2000, p.7-3.)

### **System Commissioning and Decommissioning**

Commissioning activities are designed to test the functionality of a facility's installed components and systems to ensure safe and reliable operation. Although decommissioning is often synonymous with facility closure, specific decommissioning activities also systematically test the removal of such systems to ensure a facility's safe closure. For compliance monitoring purposes, commissioning examples include interface connection and utility pre-testing, "cold" and "hot" electrical testing, system pressurization and optimization tests, grid synchronization, and combustion turbine "first fire." Decommissioning activity examples include utility shut down, system depressurization and de-electrification, structure removal, and site reclamation. (Ex. 2000, p.7-3.)

### **Start of Commercial Operation**

For compliance monitoring purposes, "commercial operation" or "operation" begins once commissioning activities are complete, the Certificate of Occupancy has been issued, and the power plant has reached reliable steady-state electrical production. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager. Operation activities can include a steady state of electrical production, or, for "peaker plants," a seasonal or on-demand operational regime to meet peak load demands. (Ex. 2000, p.7-3.)

### **Non-Operation and Closure**

"Non-operation" is time-limited and can encompass part or all of a facility. Non-operation can be a planned event, usually for minor equipment maintenance or repair, or an

unplanned event, usually the result of unanticipated events or emergencies. (Ex. 2000, p.7-3.)

“Closure” is a facility shutdown with no intent to restart operation. It may also be the cumulative result of unsuccessful efforts to re-start over an increasingly lengthy period of non-operation, condemned by inadequate means and/or lack of a viable plan. Facility closures can occur due to a variety of factors, including, but not limited to, irreparable damage and/or functional or economic obsolescence. (Ex. 2000, p.7-4.)

### **Roles and Responsibilities**

Provided below is a generalized description of the compliance roles and responsibilities for Energy Commission Staff (Staff) and the project owner for the construction and operation of the PSEGS.

### **Compliance Project Manager Responsibilities**

The CPM’s compliance monitoring and project oversight responsibilities include:

1. Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of the Decision;
2. Resolving complaints;
3. Processing post-certification project amendments for changes to the project description, conditions of certification, ownership or operational control, and requests for extension of the deadline for the start of construction (see COM-10 for instructions on filing a Petition to Amend or to Extend Construction Start Date);
4. Documenting and tracking compliance filings; and
5. Ensuring that compliance files are maintained and accessible. (Ex. 2000, p.7-4.)

The CPM is the central contact person for the Energy Commission during project pre-construction, construction, operation, emergency response, and closure. The CPM will consult with the appropriate responsible parties when handling compliance issues, disputes, complaints, and amendments. (Ex. 2000, p.7-4.)

All project compliance submittals are submitted to the CPM for processing. Where a submittal requires CPM approval, the approval will involve appropriate Energy Commission technical Staff and management. All submittals must include searchable electronic versions (.pdf, MS Word, or equivalent files). (Ex. 2000, p.7-4.)

## **Pre-Construction and Pre-Operation Compliance Meeting**

The CPM usually schedules pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. These meetings are used to assist the Energy Commission and the project owner's technical staff in the status review of all required pre-construction or pre-operation conditions of certification, and take proper action if outstanding conditions remain. In addition, these meetings ensure, to the extent possible, that the Energy Commission's conditions of certification do not delay the construction and operation of the plant due to last-minute unforeseen issues or a compliance oversight. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes. (Ex. 2000, pp.7-4. – 7-5.)

## **Energy Commission Record**

The Energy Commission maintains the following documents and information as public records, in either the Compliance files or Dockets files, for the life of the project (or other period as specified):

1. All documents demonstrating compliance with any legal requirements relating to the construction, operation, and closure of the facility;
2. All Monthly Compliance Reports (MCRs) and Annual Compliance Reports (ACRs) filed by the project owner;
3. All project-related complaints of alleged noncompliance filed with the Energy Commission; and
4. All petitions for project or condition of certification changes and the resulting Staff or Energy Commission action. (Ex. 2000, p.7-5.)

## **Chief Building Official Delegation and Agency Cooperation**

Under the California Building Code Standards, while monitoring project construction and operation, Staff acts as, and has the authority of, the Chief Building Official (CBO). Staff may delegate CBO responsibility to either an independent third-party contractor or a local building official. However, Staff retains CBO authority when selecting a delegate CBO, including the interpretation and enforcement of state and local codes, and the use of discretion, as necessary, in implementing the various codes and standards. The delegate CBO will also be responsible to facilitate compliance with all environmental conditions of certification, including cultural resources, and the implementation of all appropriate codes and standards and Energy Commission requirements. The CBO shall

conduct on-site (including linear facilities) reviews and inspections at intervals necessary to fulfill those responsibilities. The project owner will pay a delegate CBO fees necessary to cover the costs of these reviews and inspections. (Ex. 2000, p.7-5.)

### **Project Owner Responsibilities**

The project owner is responsible for ensuring that all conditions of certification in the PSEGS Decision are satisfied. The project owner will submit all compliance submittals to the CPM for processing unless the conditions specify another recipient. The Compliance conditions regarding post-certification changes specify measures that the project owner must take when modifying the project's design, operation, or performance requirements, or to transfer ownership or operational control. Failure to comply with any of the conditions of certification may result in a correction order, an administrative fine, certification revocation, or any combination thereof, as appropriate. A summary of the Compliance Conditions of Certification is included as **Compliance - Table 1** at the end of this Plan. (Ex. 2000, p.7-5.)

### **Compliance Enforcement**

The Energy Commission's legal authority to enforce the terms and conditions of its Decision are specified in Public Resources Code, sections 25534 and 25900. The Energy Commission may amend or revoke a project certification and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Decision. The Energy Commission's actions and fine assessments would take into account the specific circumstances of the incident(s). (Ex. 2000, p.7-6.)

### **Periodic Compliance Reporting**

Many of the conditions of certification require submittals in the MCRs and ACRs. All compliance submittals assist the CPM in tracking project activities and monitoring compliance with the terms and conditions of the PSEGS Decision. During construction, the project owner or an authorized agent will submit compliance reports on a monthly basis. During operation, compliance reports are submitted annually. These reports and the requirements for an accompanying compliance matrix are described below. (Ex. 2000, p.7-6.)

### **Noncompliance Complaint Procedures**

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to California Code of Regulations, title 20, section 1237, but, in many instances, the issue(s) can be resolved by using an informal dispute resolution process.

Both the informal and formal complaint procedures, as described in current state law and regulations, are summarized below. Staff will follow these provisions unless superseded by future law or regulations. The California Office of Administrative Law provides on-line access to the California Code of Regulations at <http://www.oal.ca.gov>. (Ex. 2000, p.7-6.)

### **Informal Dispute Resolution Process**

The following informal procedure is designed to resolve code and compliance interpretation disputes stemming from the project's conditions of certification and other LORS. The project owner, the Energy Commission, or any other party, including members of the public, may initiate the informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents. (Ex. 2000, p.7-6.)

This process may precede the formal complaint and investigation procedure specified in California Code of Regulations, title 20, section 1237, but is not intended to be a prerequisite or substitute for it. This informal procedure may not be used to change the terms and conditions of certification in the Decision, although the agreed-upon resolution may result in a project owner proposing an amendment. The informal dispute resolution process encourages all parties to openly discuss the conflict and reach a mutually agreeable solution. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure specified in California Code of Regulations, title 20, section 1237. (Ex. 2000, p.7-6.)

### **Request for Informal Investigation**

Any individual, group, or agency may request that the CPM conduct an informal investigation of alleged noncompliance with the Energy Commission's conditions of certification. Upon receipt of an informal investigation request, the CPM will promptly provide both verbal and written notification to the project owner of the allegation(s), along with all known and relevant information of the alleged noncompliance. The CPM will evaluate the request and, if the CPM determines that further investigation is necessary, will ask the project owner to promptly conduct a formal inquiry into the matter and provide within seven days a written report of the investigation results, along with corrective measures proposed or undertaken. Depending on the urgency of the matter, the CPM may conduct a site visit and/or request that the project owner provide an initial verbal report within 48 hours. (Ex. 2000, p.7-7.)

## **Request for Informal Meeting**

In the event that either the requesting party or Staff are not satisfied with the project owner's investigative report or corrective measures, either party may submit a written request to the CPM for a meeting with the project owner. The request shall be made within 14 days of the project owner's filing of the required investigative report. Upon receipt of such a request, the CPM will attempt to:

1. Immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. Secure the attendance of appropriate Staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. Conduct the meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner (Ex. 2000, p.7-7); and
4. After the meeting, the CPM will promptly prepare and distribute copies to all parties, and to the project file, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If no agreement was reached, the CPM will direct the complainant to the formal complaint process provided under California Code of Regulations, title 20, section 1237. (Ex. 2000, p.7-7.)

## **Formal Dispute Resolution Procedure**

Any person may file a complaint with the Energy Commission's dockets Unit alleging noncompliance with a Commission Decision adopted pursuant to Public Resources Code section 2550. Requirements for complaint filings and a description of how complaints are processed are in California Code of Regulations, title 20, section 1237. (Ex. 2000, p. 7-7.)

## **Post-Certification Changes to the Energy Commission Decision**

The project owner must petition the Energy Commission pursuant to California Code of Regulations, title 20, section 1769, to modify the design, operation, or performance requirements of the project and/or the linear facilities, or to transfer ownership or operational control of the facility. **It is the responsibility of the project owner to contact the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769.** Implementation of a project modification without first securing Energy Commission approval may result in an

enforcement action including civil penalties in accordance with Public Resources Code, section 25534.

### **Amendment**

The project owner shall submit a Petition to Amend the Energy Commission Decision, pursuant to California Code of Regulations, title 20, section 1769(a), when proposing modifications to the design, operation, or performance requirements of the project and/or the linear facilities. If a proposed modification results in an added, changed, or deleted Condition of Certification, or makes changes causing noncompliance with any applicable LORS, the Petition will be processed as a formal amendment to the Decision, triggering public notification of the proposal, public review of the Staff's analysis, and approval by the full Energy Commission. (Ex. 2000, p.7-8.)

### **Change of Ownership and/or Operational Control**

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769 (b). This process requires public notice and approval by the full Commission. The petition shall be in the form of a legal brief and fulfill the requirements of section 1769 (b). (Ex. 2000, p.7-8.)

### **Staff-Approved Project Modification**

Modifications that do not result in additions, deletions, or changes to the conditions of certification, that are compliant with the applicable LORS, and that will not have significant environmental impacts, may be authorized by the CPM as a Staff-approved project modification pursuant to section 1769 (a) (2). Once the CPM files a Notice of Determination of the proposed project modifications, any person may file an objection to the CPM's determination within 14 days of service on the grounds that the modification does not meet the criteria of section 1769 (a) (2). If there is a valid objection to the CPM's determination, the petition must be processed as a formal amendment to the Decision and must be considered for approval by the full Commission at a publically noticed business meeting or hearing. (Ex. 2000, p.7-8.)

### **Verification Change**

Each Condition of Certification (except for the compliance conditions) has one or more means of verifying the project owner's compliance with the provisions of the condition. These verifications specify the actions and deadlines by which a project owner demonstrates compliance with the Energy Commission adopted conditions. A verification may be modified by the CPM without requesting a Decision amendment if

the change does not conflict with any Condition of Certification, does not violate any LORS, and provides an effective alternative means of verification. (Ex. 2000, p.7-9.)

### **Emergency Response Contingency Planning and Incident Reporting**

To protect public health and safety and environmental quality, the conditions of certification include contingency planning and incident reporting requirements to ensure compliance with necessary health and safety practices. A well-drafted contingency plan avoids or limits potential hazards and impacts resulting from serious incidents involving personal injury, hazardous spills, flood, fire, explosions or other catastrophic events and ensures a comprehensive timely response. All such incidents must be reported immediately to the CPM and documented. These requirements are designed to build from “lessons learned” to limit the hazards and impacts, anticipate and prevent recurrence, and provide for the safe and secure shutdown and re-start of the facility. (Ex. 2000, p.7-9.)

### **Facility Closure**

The Energy Commission cannot reasonably foresee all potential circumstances in existence when a facility permanently closes. Therefore, the closure conditions provided herein strive for the flexibility to address circumstances that may exist at some future time. Most importantly, facility closure must be consistent with all applicable Energy Commission conditions of certification and the LORS in effect at that time. (Ex. 2000, p.7-9.)

Although a non-operational facility may intend to resume operations, if it remains non-operational for longer than one year and the project owner does not present a viable plan to resume operation, the Energy Commission can conclude that closure is imminent and direct the project owner to commence closure procedures under the jurisdiction and guidance of the Bureau of Land Management. (Ex. 2000, p.7-9.)

Prior to submittal of the facility’s Final Closure Plan to the Energy Commission, the project owner and the CPM will hold a meeting to discuss the specific contents of the plan. In the event that significant issues are associated with the plan’s approval, the CPM will hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure. (Ex. 2000, p.7-9.)

With the exception of measures to eliminate any immediate threats to public health and safety or to the environment, facility closure activities cannot be initiated until the Energy Commission approves the Final Closure Plan and Cost Estimate and the project owner

complies with any requirements the Commission may incorporate as conditions of approval of the Final Closure Plan. (Ex. 2000, p.7-9.)

## **PUBLIC COMMENT**

The following public comment was received on compliance and closure:

On October 29, 2013, the **County of Riverside** provided comments suggesting that the Commission include a detailed facility closure plan and require a bond to be posted to cover the costs of remediating the site. However, in the absence of substantial evidence of the necessity for such a bond in the record, we do not have a basis to impose such a condition.

## **COMPLIANCE CONDITIONS OF CERTIFICATION**

**COM-1: Unrestricted Access.** The project owner shall take all steps necessary to ensure that the CPM, responsible Staff, and delegate agencies or consultants have unrestricted access to the facility site, related facilities, project-related staff, and the records maintained on-site to facilitate audits, surveys, inspections, and general or closure-related site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time, whether such visits are by the CPM in person or through representatives from Staff, delegate agencies, or consultants.

**COM-2: Compliance Record.** The project owner shall maintain electronic copies of all project files and submittals on-site, or at an alternative site approved by the CPM, for the operational life and closure of the project. The files shall also contain at least one hard copy of:

1. The facility's Application for Certification;
2. All amendment petitions and Energy Commission orders;
3. All finalized original and amended structural plans and "as-built" drawings for the entire project;
4. All citations, warnings, violations, or corrective actions applicable to the project; and

5. The most current versions of any plans, manuals, and training documentation required by the conditions of certification or applicable LORS.

Staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

**COM-3: Compliance Verification Submittals.** Verification lead times associated with the start of construction or closure may require the project owner to file submittals during the AFC process, particularly if construction is planned to commence shortly after certification. The verification procedures, unlike the conditions, may be modified as necessary by the CPM.

A cover letter from the project owner or an authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. *The cover letter subject line shall identify the project by AFC number, cite the appropriate Condition of Certification number(s), and give a brief description of the subject of the submittal.* When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and the condition(s) of certification applicable.

All reports and plans required by the project's conditions of certification shall be submitted in a searchable electronic format (.pdf, MS Word or Excel, etc.) and include standard formatting elements such as a table of contents, identifying by title and page number, each section, table, graphic, exhibit, or addendum. All report and/or plan graphics and maps shall be adequately scaled and shall include a key with descriptive labels, directional headings, a bar scale, and the most recent revision date.

The project owner is responsible for the content and delivery of all verification submittals to the CPM, whether the actions required by the verification were satisfied by the project owner or an agent of the project owner. All submittals shall be accompanied by an electronic copy on an electronic storage medium, or by e-mail, as agreed upon by the CPM. If hardcopy submittals are required, please address as follows:

Christine Stora, Compliance Project Manager  
Palen Solar Electric Generating System (09-AFC-7C)  
California Energy Commission  
1516 Ninth Street (MS-2000)  
Sacramento, CA 95814

**COM-4: Pre-Construction Matrix and Tasks Prior to Start of Construction.**

Prior to start of construction, the project owner shall submit to the CPM a compliance matrix including only those conditions that must be fulfilled before the start of construction. The matrix shall be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first, and shall be submitted in a format similar to that described below.

Site mobilization and construction activities shall not start until all of the following occur: the project owner has submitted the pre-construction matrix and compliance verifications pertaining to all pre-construction conditions of certification and the CPM has issued an authorization-to-construct letter to the project owner. The deadlines for submitting various compliance verifications to the CPM allow sufficient staff time to review and comment on and, if necessary, allow the project owner to revise the submittal in a timely manner. These procedures help ensure that project construction proceeds according to schedule. Failure to submit required compliance documents by the specified deadlines may result in delayed authorizations to commence various stages of the project.

If the project owner anticipates site mobilization immediately following project certification, it may be necessary for the project owner to file compliance submittals prior to project certification. In these instances, compliance verifications can be submitted in advance of the required deadlines and the anticipated authorizations to start construction. The project owner must understand that submitting compliance verifications prior to these authorizations is at the owner's own risk. Any approval by Staff prior to project certification is subject to change based upon the Commission Decision, or amendment thereto, and early staff compliance approvals do not imply that the Energy Commission will certify the project for actual construction and operation.

Construction may commence subsequent to CPM issuance of a letter authorizing the owner to proceed. The CPM may issue limited notices to proceed to allow one or more portions of construction to commence. A limited notice to proceed, if issued, will specify what activities can occur and what specific conditions must be met to commence the activities identified in the notice.

**COM-5: Compliance Matrix.** The project owner shall submit a compliance matrix to the CPM with each MCR and ACR. The compliance matrix provides the CPM with the status of all conditions of certification in a spreadsheet format. The compliance matrix shall identify:

1. The technical area;
2. The condition number;
3. A brief description of the verification action or submittal required by the condition;
4. The date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. The expected or actual submittal date;
6. The date a submittal or action was approved by the CBO, CPM, or delegate agency, if applicable;
7. The compliance status of each condition, e.g., “not started,” “in progress,” or “completed” (include the date); and
8. If the condition was amended, the updated language and the date the amendment was proposed or approved.

The CPM can provide a template for the compliance matrix upon request.

**COM-6: Monthly Compliance Reports and Key Events List.** The first Monthly Compliance Report (MCR) is due one (1) month following the docketing of the project’s Decision, unless otherwise agreed to by the CPM. The first MCR shall include the AFC number and an initial list of dates for each of the events identified on the Key Events List. (The Key Events List form is found at the end of this Plan.)

During project pre-construction, construction, or closure, the project owner or authorized agent shall submit an electronic searchable version of the

MCR within ten (10) business days after the end of each reporting month, unless otherwise specified by the CPM. MCRs shall be clearly identified for the month being reported. The searchable electronic copy may be filed on an electronic storage medium or by e-mail, subject to CPM approval. The compliance verification submittal condition provides guidance on report production standards, and the MCR shall contain, at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. Documents required by specific conditions to be submitted along with the MCR; each of these items shall be identified in the transmittal letter, as well as the conditions they satisfy, and submitted as attachments to the MCR;
3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification;
4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. A cumulative list of any approved changes to the conditions of certification;
7. A list of any filings submitted to, and permits issued by, other governmental agencies during the month;
8. A projection of project compliance activities scheduled during the next two months; the project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. A list of the month's additions to the on-site compliance file; and
10. A list of complaints, notices of violation, official warnings, and citations received during the month, a description of the actions taken to date to resolve the issues; and the status of any unresolved actions.

**COM-7: Annual Compliance Reports (ACRs).** After construction is complete, the project owner shall submit searchable electronic ACRs instead of MCRs. ACRs shall be completed for each year of commercial operation, may be required for a specified period after decommissioning to monitor closure compliance, as specified by the CPM, and are due each year on a date agreed to by the CPM. The searchable electronic copies may be filed on an electronic storage medium or by e-mail, subject to CPM approval. Each ACR shall include the AFC number, identify the reporting period, and contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. Documents required by specific conditions to be submitted along with the ACR. Each of these items shall be identified in the transmittal letter with the condition it satisfies, and submitted as attachments to the ACR;
4. A cumulative list of all post-certification changes approved by the Energy Commission or the CPM;
5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. A list of filings submitted to, or permits issued by, other governmental agencies during the year;
7. A projection of project compliance activities scheduled during the next year;
8. A list of the year's additions to the on-site compliance file;
9. An evaluation of the Site Contingency Plan, including amendments and plan updates; and
10. A list of complaints, notices of violation, official warnings, and citations received during the year, a description of how the issues were resolved, and the status of any unresolved matters.

**COM-8: Confidential Information.** Any information that the project owner designates as confidential shall be submitted to the Energy Commission's Executive Director with an application for confidentiality, pursuant to California Code of Regulations, title 20, section 2505 (a). Any information deemed confidential pursuant to the regulations will remain undisclosed, as provided in California Code of Regulations, title 20, section 2501.

**COM-9: Annual Energy Facility Compliance Fee.** Pursuant to the provisions of section 25806 (b) of the Public Resources Code, the project owner is required to pay an annually adjusted compliance fee. Current compliance fee information is available on the Energy Commission's website at:

[http://www.energy.ca.gov/siting/filing\\_fees.html](http://www.energy.ca.gov/siting/filing_fees.html).

The project owner may also contact the CPM for the current fee information. The initial payment is due on the date the Energy Commission docket its final Decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification.

**COM-10: Amendments, Staff-Approved Project Modifications, Ownership Changes, and Verification Changes.** The project owner shall petition the Energy Commission, pursuant to California Code of Regulations, title 20, section 1769, to modify the design, operation, or performance requirements of the project or linear facilities, or to transfer ownership or operational control of the facility. The CPM will determine whether staff approval will be sufficient or whether Commission approval will be necessary. **It is the project owner's responsibility to contact the CPM to determine if a proposed project change triggers the requirements of section 1769.** Section 1769 details the required contents for a Petition to Amend an Energy Commission Decision. The only change that can be requested by means of a letter to the CPM is a request to change the verification method of a Condition of Certification.

Implementation of a project modification without first securing Energy Commission, or Staff approval, may result in an enforcement action, including civil penalties, in accordance with section 25534 of the Public Resources Code. If the Energy Commission's rules regarding amendments are revised, the rules in effect at the time the change is requested shall apply.

**COM-11: Reporting of Complaints, Notices, and Citations.** Prior to the start of construction or decommissioning, the project owner shall send a letter to property owners within one (1) mile of the project, notifying them of a telephone number to contact project representatives with questions, complaints, or concerns. If the telephone is not staffed twenty-four (24) hours per day, it shall include automatic answering with a date and time stamp recording.

The project owner shall respond to all recorded complaints within twenty-four (24) hours or the next business day. The project site shall post the telephone number on site and make it easily visible to passersby during construction, operation, and closure. The project owner shall provide the contact information to the CPM who will post it on the Energy Commission's web page at:

<http://www.energy.ca.gov/sitingcases/palen/>.

The project owner shall report any disruption to the contact system or telephone number change to the CPM promptly, to allow the CPM to update the Energy Commission's facility webpage accordingly.

In addition to including all complaints, notices, and citations included with the MCRs and ACRs, within ten (10) days of receipt, the project owner shall report, and provide copies to the CPM, of all complaints, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the *Noise and Vibration* conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A) at the end of this Plan.

**COM-12: Emergency Response Site Contingency Plan.** No less than sixty (60) days prior to the start of commercial operation, or other date agreed to by the CPM, the project owner shall submit for CPM review and approval, an *Emergency Response Site Contingency Plan* (Contingency Plan). The Contingency Plan shall evidence a facility's coordinated emergency response and recovery preparedness for a series of reasonably foreseeable emergency events. The CPM may require the updating of the Contingency Plan over the life of the facility. The Contingency Plan elements include, but are not limited to:

1. A site-specific list and direct contact information for persons, agencies, and responders to be notified for an unanticipated event;
2. A detailed and labeled facility map, including all fences and gates, the windsock location (if applicable), the on- and off-site assembly areas the main roads and highways near the site;
3. A detailed and labeled map of population centers, sensitive receptors, and the nearest emergency response facilities;
4. A description of the on-site, first response and backup emergency alert communication systems, site-specific emergency response protocols, and procedures for maintaining the facility's contingency response capabilities, including a detailed map of interior and exterior evacuation routes, and the planned location(s) of all permanent safety equipment;
5. An organizational chart including the name, contact information, and first aid/emergency response certification(s) and renewal date(s) for all personnel regularly on-site;
6. A brief description of reasonably foreseeable, site-specific incidents and accident sequences (on- and off-site), including response procedures and protocols and site security measures to maintain twenty-four-hour site security;
7. Procedures for maintaining contingency response capabilities; and
8. The procedures and implementation sequence for the safe and secure shutdown of all non-critical equipment and removal of hazardous materials and waste (see also specific conditions of certification for the technical areas of Public Health, Solid Waste Management, Hazardous Materials Management, and Worker Safety).

**COM-13: Incident-Reporting Requirements.** Within one (1) hour, the project owner shall notify the CPM or Compliance Office Manager, by telephone and e-mail, of any incident at the power plant or appurtenant facilities that results or could result in any of the following:

1. Reduction in the facility's ability to respond to dispatch (excluding forced outages caused by protective equipment or other typically encountered shutdown events);
2. Health and safety impacts on the surrounding population;

3. Property damage off-site;
4. Response by off-site emergency response agencies;
5. Serious on-site injury;
6. Serious environmental damage; or
7. Emergency reporting to any federal, state, or local agency.

The notice shall describe the circumstances, status, and expected duration of the incident.

If warranted, as soon as it is safe and feasible, the project owner shall implement the safe shutdown of any non-critical equipment and removal of any hazardous materials and waste that pose a threat to public health and safety and to environmental quality (also, see specific conditions of certification for the technical areas of *Hazardous Materials Management* and *Solid Waste Management*).

Within one (1) week of the incident, the project owner shall submit to the CPM a detailed incident report, which shall include, as appropriate, the following information:

1. A brief description of the incident, including its date, time, and location;
2. A description of the cause of the incident, or likely causes if it is still under investigation;
3. The location of any off-site impacts;
4. Description of any resultant impacts;
5. A description of emergency response actions associated with the incident;
6. Identification of responding agencies;
7. Identification of emergency notifications made to federal, state, and/or local agencies;
8. Identification of any hazardous materials released and an estimate of the quantity released;
9. A description of any injuries, fatalities, or property damage that occurred as a result of the incident;

10. Fines or violations assessed or being processed by other agencies;
11. Name, phone number, and e-mail address of the appropriate facility contact person having knowledge of the event; and
12. Corrective actions to prevent a recurrence of the incident.

The project owner shall maintain all incident report records for the life of the project, including closure. After the submittal of the initial report for any incident, the project owner shall submit to the CPM copies of incident reports within twenty-four (24) hours of a request.

**COM-14: Non-Operation.** If the facility ceases operation temporarily, either planned or unplanned, for longer than one (1) week (or other CPM-approved date), but less than three (3) months (or other CPM-approved date), the project owner shall notify the CPM, interested agencies, and nearby property owners. Notice of planned non-operation shall be given at least two (2) weeks prior to the scheduled date. Notice of unplanned non-operation shall be provided no later than one (1) week after non-operation begins.

For any non-operation, a *Repair/Restoration Plan* for conducting the activities necessary to restore the facility to availability and reliable and/or improved performance shall be submitted to the CPM within one (1) week after notice of non-operation is given. If non-operation is due to an unplanned incident, temporary repairs and/or corrective actions may be undertaken before the Repair/Restoration Plan is submitted. The Repair/Restoration Plan shall include:

1. Identification of operational and non-operational components of the plant;
2. A detailed description of the repair or restoration activities;
3. A proposed schedule for completing the repair or restoration activities;
4. An assessment of whether or not the proposed activities would require changing, adding, and/or deleting any conditions of certification and/or would cause noncompliance with any applicable LORS;
5. Planned activities during non-operation, including any measures to ensure continued compliance with all conditions of certification and LORS.

Written updates to the CPM for non-operational periods, until operation resumes, shall include:

1. Progress relative to the schedule;
2. Developments that delayed or advanced progress or that may delay or advance future progress;
3. Any public, agency, or media comments or complaints; and
4. Projected date for the resumption of operation.

During non-operation, all applicable conditions of certification and reporting requirements remain in effect. If, after one (1) year from the date of the project owner's last report of productive Repair/Restoration Plan work, the facility does not resume operation or does not provide a plan to resume operation, the Executive Director may assign suspended status to the facility and recommend commencement of permanent closure activities:

1. If the facility has a closure plan, the project owner shall update it and submit it for Energy Commission review and approval; and
2. If the facility does not have a closure plan, the project owner shall develop one consistent with the requirements in this Plan and submit it for Energy Commission review and approval.

**COM-15: Facility Closure Planning.** To ensure that a facility's eventual permanent closure and long-term maintenance do not pose a threat to public health and safety and/or to environmental quality, the project owner shall coordinate with the Energy Commission to plan and prepare for eventual permanent closure.

A. Provisional Closure Plan and Estimate of Permanent Closure Costs

To assure satisfactory long-term site maintenance and adequate closure for "the whole of a project," the project owner shall submit a Provisional Closure Plan and Cost Estimate for CPM review and approval within sixty (60) days after the start of commercial operation. The Provisional Closure Plan and Cost Estimate shall consider applicable final closure plan requirements, including interim and long-term, post-closure site maintenance costs, and reflect:

1. Facility closure costs at a time in the facility's projected life span when the mode and scope of facility operation would make permanent closure the most expensive;
  2. The use of an independent third party to carry out the permanent closure; and
  3. No use of salvage value to offset closure costs.
- B. The Provisional Closure Plan and Cost Estimate shall provide for a phased closure process and include but not be limited to:
1. A comprehensive scope of work and itemized budget;
  2. Closure plan development costs;
  3. Dismantling and demolition;
  4. Recycling and site clean-up;
  5. Mitigation and monitoring direct, indirect, and cumulative impacts;
  6. Site remediation and/or restoration;
  7. Interim operation and post-closure monitoring and maintenance, including long-term equipment replacement costs; and
  8. Contingencies.

The project owner shall include an updated Provisional Closure Plan and Cost Estimate in every fifth-year ACR for CPM review and approval. Each updated Provisional Closure Plan and Cost Estimate shall reflect the most current regulatory standards, best management practices, and applicable LORS.

C. Final Closure Plan and Cost Estimate

At least 3 years prior to initiating a permanent facility closure, the project owner shall submit for Energy Commission review and approval, a Final Closure Plan and Cost Estimate, which includes any long-term, post-closure site maintenance and monitoring. Final Closure Plan and Cost Estimate contents include, but are not limited to:

1. A statement of specific Final Closure Plan objectives;

2. A statement of qualifications and resumes of the technical experts proposed to conduct the closure activities, with detailed descriptions of previous power plant closure experience;
3. Identification of any facility-related installations not part of the Energy Commission certification, designation of who is responsible for these, and an explanation of what will be done with them after closure; and
4. A comprehensive scope of work and itemized budget for permanent plant closure and long-term site maintenance activities, with a description and explanation of methods to be used, broken down by phases, including, but not limited to:
  - a. Dismantling and demolition;
  - b. Recycling and site clean-up;
  - c. Impact mitigation and monitoring;
  - d. Site remediation and/or restoration;
  - e. Post-closure maintenance; and
  - f. Contingencies;
5. A revised/updated Final Cost Estimate for all closure activities, by phases, including long-term, post-closure site monitoring and maintenance costs, and replacement of long-term post-closure equipment;
6. A schedule projecting all phases of closure activities for the power plant site and all appurtenances constructed as part of the Energy Commission-certified project;
7. An electronic submittal package of all relevant plans, drawings, risk assessments, and maintenance schedules and/or reports, including an above- and below-ground infrastructure inventory map and registered engineer's or delegate CBO's assessment of demolishing the facility; additionally, for any facility that permanently ceased operation prior to submitting a Final Closure Plan and Cost Estimate and for which only minimal or no maintenance has been done since, a comprehensive condition report focused on identifying potential hazards;

8. All information additionally required by the facility's conditions of certification applicable to plant closure;
9. An equipment disposition plan including:
  - a. Recycling and disposal methods for equipment and materials; and
  - b. Identification and justification for any equipment and materials that will remain on-site after closure;
10. A site disposition plan, including but not limited to:
  - a. Proposed rehabilitation, restoration, and/or remediation procedures, as required by the conditions of certification and applicable LORS;
  - b. Long-term site maintenance activities; and
  - c. Anticipated future land-use options after closure.
11. Identification and assessment of all potential direct, indirect, and cumulative impacts and proposal of mitigation measures to reduce significant adverse impacts to a less-than-significant level; potential impacts to be considered shall include, but not be limited to:
  - a. Traffic;
  - b. Noise and vibration;
  - c. Soil erosion;
  - d. Air quality degradation;
  - e. Solid waste;
  - f. Solid waste/hazardous materials;
  - g. Waste water discharges; and
  - h. Contaminated soil.
12. Identification of all current conditions of certification, LORS, federal, state, regional, and local planning efforts applicable to the facility, and proposed strategies for achieving and maintaining compliance during closure;

13. Updated mailing list or listserv of all responsible agencies, potentially interested parties, and property owners within 1 mile of the facility;
14. Identification of alternatives to plant closure and assessment of the feasibility and environmental impacts of these; and
15. Description of and schedule for security measures and safe shutdown of all non-critical equipment and removal of hazardous materials and waste (see conditions of certification for Public Health, Solid Waste Management, Hazardous Materials Management, and Worker Safety).

If an Energy Commission-approved Final Closure Plan and Cost Estimate are not implemented within 1 year of its approval date, it shall be updated and re-submitted to the Commission for supplementary review and approval. If a project owner initiates but then suspends closure activities, and the suspension continues for longer than 1 year, or subsequently abandons the facility, the Energy Commission may access the required financial assurance funds to complete the closure. The project owner remains liable for all costs of contingency planning and closure.

**COM-16: CBO Delegation.** Under the California Building Code Standards, while monitoring project construction and operation, staff acts as, and has the authority of, the Chief Building Official (CBO). Staff may delegate CBO responsibility to either an independent third-party contractor or a local building official. However, staff retains CBO authority when selecting a delegate CBO, including the interpretation and enforcement of state and local codes and standards and the use of discretion, as necessary, in implementing the various codes and standards. The CBO shall conduct on-site (including linear facilities) reviews and inspections at intervals necessary to fulfill those responsibilities.

The delegate CBO will also be responsible for coordinating compliance with all environmental conditions of certification and the implementation of all appropriate codes and standards. The CBO's role would not be expanded to nor duplicate the inspection roles of the on-site Designated Biologist (DB), Cultural Resource Specialist (CRS), or Air Quality Construction Mitigation Manager (AQCOMM) provided by the project owner,

nor duplicate Staff's role with respect to review and approval of environmental compliance and mitigation plans.

The project owner will pay delegate CBO fees necessary to cover the costs of the on-site reviews, inspections, and environmental coordination. The project owner shall provide proof of its agreement to fund the activities of the CBO at least 60 days prior to the start of construction activity.

# KEY EVENTS LIST

**PROJECT:** \_\_\_\_\_

**DOCKET #:** \_\_\_\_\_

**COMPLIANCE PROJECT MANAGER:** \_\_\_\_\_

EVENT DESCRIPTION	DATE
Certification Date	
Obtain Site Control	
On-line Date	
<b>POWER PLANT SITE ACTIVITIES</b>	_____
Start Site Assessment/Pre-construction	
Start Site Mobilization/Construction	
Begin Pouring Major Foundation Concrete	
Begin Installation of Major Equipment	
Completion of Installation of Major Equipment	
First Combustion of Gas Turbine	
Obtain Building Occupation Permit	
Start Commercial Operation	
Complete All Construction	
<b>TRANSMISSION LINE ACTIVITIES</b>	_____
Start T/L Construction	
○ Synchronization with Grid and Interconnection	
Complete T/L Construction	
<b>FUEL SUPPLY LINE ACTIVITIES</b>	_____
Start Gas Pipeline Construction and Interconnection	
○ Complete Gas Pipeline Construction	

<b>WATER SUPPLY LINE ACTIVITIES</b>		
○ Construction	Start Water Supply Line	
Complete Water Supply Line Construction		

Complaint Log Number: \_\_\_\_\_ Docket Number: \_\_\_\_\_

Project Name: \_\_\_\_\_

**COMPLAINANT INFORMATION**

Name: \_\_\_\_\_ Phone Number: \_\_\_\_\_  
Address: \_\_\_\_\_

**COMPLAINT**

DATE COMPLAINT RECEIVED: \_\_\_\_\_ TIME COMPLAINT RECEIVED: \_\_\_\_\_  
COMPLAINT RECEIVED BY: \_\_\_\_\_  TELEPHONE  IN WRITING (COPY ATTACHED)  
DATE OF FIRST OCCURRENCE: \_\_\_\_\_  
DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION): \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
FINDINGS OF INVESTIGATION BY PLANT PERSONNEL: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT?  YES  NO  
DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS: \_\_\_\_\_  
DESCRIPTION OF CORRECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION?  YES  NO  
IF NOT, EXPLAIN: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CORRECTIVE ACTION**

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED: \_\_\_\_\_

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED): \_\_\_\_\_

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED): \_\_\_\_\_

OTHER RELEVANT INFORMATION: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*"This information is certified to be correct."*

PLANT MANAGER SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

## **IV. ENGINEERING ASSESSMENT**

The broad engineering assessment of the Palen Solar Electric Generating System (PSEGS) consists of separate analyses that examine its facility design, engineering efficiency, and reliability aspects. These analyses include the on-site power generating equipment and the project-related linear facilities.

### **A. FACILITY DESIGN**

#### **DESCRIPTION OF MODIFICATIONS**

The amended project (PSEGS) will occupy the same location as the certified project (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The modifications proposed in the petition include replacing the parabolic trough solar collection system, steam turbine generator, and associated heat transfer fluid with BrightSource's solar tower technology. Heliostats, which are elevated mirrors guided by a tracking system mounted on a pylon, focus the sun's rays on a solar receiver steam generator (SRSG) located atop a 750-foot-tall tower near the center of each solar field to create steam to drive a turbine that generates electricity. The primary modifications relevant to facility design are that the Land Treatment Units for heat transfer fluid have been eliminated as well as the large assembly hall. The evaporation ponds have been reduced from four 4-acre ponds to two 2-acre ponds. The large drainage structures surrounding the site have been eliminated. The PSEGS Project includes a minor re-routing of the generation tie-line near the western end of the route and at the tie-in location to the Red Bluff Substation. The secondary access road has been eliminated and replaced with a secondary access gate and the redundant telecommunication line has been rerouted to be buried along the generation tie-line route. The use of propane has been replaced with natural gas that will be delivered via a new extension of the existing SoCal Gas distribution system to the project boundary. (Ex. 1003, p. 3.1-2; Ex. 2000, p. 5.1-2.)

The following evidence on facility design was received into evidence on October 29, 2013: Exhibits 1003, 1076, 2000, 2002, and 2008. (10/29/13 RT 19:21 – 22:3.)

#### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP observed that evidence summarized in facility design addresses consistency with applicable laws, ordinances, regulations, and standards (LORS), and does not extend to an evaluation of the project's environmental impacts. The conditions of certification set forth in the PSPP Decision require that qualified personnel perform design review, plan checking, and field inspections of the project. PSPP's conditions of certification ensure that the project is

designed and constructed in accordance with applicable law and in a manner that protects public health and safety. The general conditions, included in the **COMPLIANCE AND CLOSURE** section of the PSPP Decision, establish requirements to be followed in the event of facility closure. The Decision concluded that the PSPP facility could be designed and constructed in conformity with applicable LORS. (PSPP Final Decision, CEC-800-2010-011, Facility Design, p. 3.)

## **THE AMENDED PROJECT'S IMPACTS**

The purpose of the facility design analysis is to ensure that the PSEGS project will be built to applicable engineering codes, which would ensure public health and life safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the project owner's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission compliance project manager (CPM) and the project owner to adopt a compliance monitoring scheme that would verify compliance with these LORS. (Ex. 2000, p. 5.1-2.)

### **Site Preparation and Development**

The record contains an evaluation of the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and constructing linear support facilities such as natural gas and electric transmission interconnections. The project owner proposes the use of accepted industry standards, design practices, and construction methods in preparing and developing the site. Staff concurred that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS. We impose conditions of certification (see below and the **GEOLOGY AND PALEONTOLOGY** section of this Decision) to ensure that compliance is met. (Ex. 2000, p. 5.1-3.)

### **Major Structures, Systems, and Equipment**

Major structures, systems, and equipment are structures and their associated components or equipment, which are necessary for power production. These major structures, systems and equipment are costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. (Ex. 2000, p. 5.1-3.)

PSEGS must be designed and constructed to the 2010 California Building Standards Code (CBSC), also known as California Code of Regulations, title 24, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the Chief Building Official (CBO) for review and approval after the update to the 2010 CBSC takes effect, the updated provision shall replace the 2010 CBSC. (Ex. 2000, p. 5.1-3.)

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed according to their appropriate lateral force procedure, we will impose Condition of Certification **STRUC-1**, below, which in part requires the project CBO's review and approval of the project owner's proposed lateral force procedures before construction begins. (Ex. 2000, p. 5.1-3.)

### **Project Quality Procedures**

The PSEGS Petition to Amend (Ex. 1003, § 3.1.3, Appendices 2E through 2J) describes a quality program intended to inspire confidence that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements will be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program will ensure that PSEGS is actually designed, procured, fabricated, and installed as described in the Petition (see the **POWER PLANT RELIABILITY** section for more information regarding the PSEGS' QA/QC program). (Ex. 2000, p. 5.1-3.)

### **Compliance Monitoring**

Under California Code of Regulations, title 24, part 2, section 104.2 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official, and has the responsibility to enforce the code for all of the energy facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions. (Ex. 2000, p. 5.1-4.)

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all facility design conditions of certification are

met. As provided by section 104.2.2 of the CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The project owner, through permit fees provided by the CBC, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the project owner pays in lieu of CBC permit fees to cover the costs of these reviews and inspections. (Ex. 2000, p. 5.1-4.)

The California Energy Commission has developed proposed conditions of certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who will design and build the proposed modified project (Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the PSEGS project's construction (subject to CBO review and approval) be approved by the CBO before it is performed. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS. (Ex. 2000, p. 5.1-4.)

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of construction (of permanent facilities subject to CBO review and approval), which could be difficult to reverse or correct can proceed without prior CBO approval. Elements of construction that are not difficult to reverse may proceed without approval of the plans. The project owner bears the responsibility to fully modify construction elements in order to comply with all design changes resulting from the CBO's subsequent plan review and approval process. (Ex. 2000, p. 5.1-4.)

### **Facility Closure**

The removal of a facility from service, or closure, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the closure decision are largely unknown at this time. (Ex. 2000, p. 5.1-4.)

In order to assure that closure of the facility will be completed in a manner that is environmentally sound, safe and will protect public health and safety, the project owner shall submit a closure plan to the Energy Commission for review and approval prior to the commencement of closing the facility as required in Condition of Certification **COM-**

**15; Facility Closure Plans** in the general conditions section of this Decision. The requirements in the general conditions are adequate protection, even in the unlikely event of project abandonment. (Ex. 2000, p. 5.1-5.)

### **Cumulative Impacts**

Cumulative impacts analysis does not apply to facility design.

### **Laws, Ordinances, Regulations and Standards (LORS)**

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the PSEGS's Petition to Amend (Ex. 1003, §§ 2.15.1, 3.1.4, appendices 2E through 2J). Key LORS are listed in **Appendix A** of this Decision.

### **Findings Specific to an Amendment**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information, which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

### **Benefits**

A project benefits analysis does not apply to facility design.

### **PUBLIC COMMENT**

There were no comments received from the public regarding the facility design.

### **FINDINGS OF FACT**

Based on the evidence of record, the Commission makes the following findings:

1. Although the PSPP has been certified, the PSEGS amendment is currently in the preliminary design stage.
2. The evidence summarized in **FACILITY DESIGN** addresses consistency with applicable LORS, and does not extend to an evaluation of the project's environmental impacts.

3. The PSEGS facility will be designed and constructed in conformity with the applicable LORS set forth in the appropriate portion of **Appendix A** of this Decision.
4. The conditions of certification set forth below provide, in part, that qualified personnel will perform design review, plan checking, and field inspections of the project.
5. The conditions of certification set forth below are necessary to ensure that the project is designed and constructed in accordance with applicable law and in a manner that protects public health and safety.
6. The general conditions included in the **COMPLIANCE AND CLOSURE** section of this Decision establish requirements to be followed in the event of facility closure.
7. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

### **CONCLUSION OF LAW**

We, therefore, conclude that implementation of the conditions of certification listed below ensure that PSEGS will be designed and constructed in conformance with the applicable LORS pertinent to the engineering aspects summarized in this section of the Decision.

### **CONDITIONS OF CERTIFICATION**

(Note: All the **FACILITY DESIGN** Conditions of Certification remain unchanged except for a minor edit to update the edition of the CBSC from 2007 to 2010.)

**GEN-1** The project owner shall design, construct, and inspect the project in accordance with the 2010 California Building Standards Code (CBSC), also known as title 24, California Code of Regulations, which encompasses the CBC, California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The

project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, maintenance, or closure of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2010 CBSC is in effect, the 2010 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

**VERIFICATION:** Within 30 days following receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a Statement of Verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO.

Once the Certificate of Occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

**GEN-2** Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly

or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the date of each submittal to the CBO. To facilitate audits by Energy Commission Staff, the project owner shall provide specific packages to the CPM upon request.

**VERIFICATION:** At least 60 days (or a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, and the master drawings and master specifications list of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures, systems, and equipment defined above in Condition of Certification **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

**GEN-3** The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO, in accordance with the 2010 CBC. These fees may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

**VERIFICATION:** The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid.

**GEN-4** Prior to the start of rough grading, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of

the CBO's approvals of the RE and other delegated engineer(s) within 5 days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has 5 days to submit the resume and registration number of the newly-assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within 5 days of the approval.

**GEN-5** Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

- A. The civil engineer shall:
  - 1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
  - 2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and
  - 3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.
- B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering shall:
  - 1. Review all the engineering geology reports;
  - 2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;
  - 3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2010 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
  - 4. Recommend field changes to the civil engineer and RE. This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

- C. The engineering geologist shall:
  - 1. Review all the engineering geology reports and prepare a final soils grading report; and
  - 2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2010 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).
- D. The design engineer shall:
  - 1. Be directly responsible for the design of the proposed structures and equipment supports;
  - 2. Provide consultation to the RE during design and construction of the project;
  - 3. Monitor construction progress to ensure compliance with engineering LORS;
  - 4. Evaluate and recommend necessary changes in design; and
  - 5. Prepare and sign all major building plans, specifications, and calculations.
- E. The mechanical engineer shall be responsible for, and sign and stamp a statement with each mechanical submittal to the CBO stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.
- F. The electrical engineer shall:
  - 1. Be responsible for the electrical design of the project; and
  - 2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within 5 days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has 5 days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within 5 days of the approval.

**GEN-6** Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2010 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Inspect the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved

plans, specifications, and other provisions of the applicable edition of the CBC.

**VERIFICATION:** At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has 5 days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within 5 days of the approval.

**GEN-7** If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

**VERIFICATION:** The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within 5 days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

**GEN-8** The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

**VERIFICATION:** Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO 3 sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe .pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

**CIVIL-1** The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2010 CBC.

**VERIFICATION:** At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

**CIVIL-2** The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

**VERIFICATION:** The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil

conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

**CIVIL-3** The project owner shall perform inspections in accordance with the 2010 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

**VERIFICATION:** Within 5 days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within 5 days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

**CIVIL-4** After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

**VERIFICATION:** Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

**STRUC-1** Prior to the start of any increment of construction, the project owner shall submit plans, calculations and other supporting documentation to the CBO for design review and acceptance for all project structures and equipment

identified in the CBO-approved master drawing and master specifications lists. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

**VERIFICATION:** At least 60 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

**STRUC-2** The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2010 CBC.

**VERIFICATION:** If a discrepancy is discovered in any of the above data, the project owner shall, within 5 days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within 5 days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within 5 days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

**STRUC-3** The project owner shall submit to the CBO design changes to the final plans required by the U.S Energy Information Administration, "Natural Gas Pipelines in the Western Region, 2010 CBC, including the revised

drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

**VERIFICATION:** On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

**STRUC-4** Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2010 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

**MECH-1** The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in the CBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable LORS, which may include, but are not limited to:

1. American National Standards Institute (ANSI) B31.1 (Power Piping Code);
2. ANSI B31.2 (Fuel Gas Piping Code);
3. ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
4. ANSI B31.8 (Gas Transmission and Distribution Piping Code);
5. NACE R.P. 0169-83;
6. NACE R.P. 0187-87;
7. NFPA 56;
8. California Code of Regulations, tit. 24, part 5 (California Plumbing Code);
9. California Code of Regulations, tit. 24, part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
10. California Code of Regulations, tit. 24, part 2 (California Building Code);
11. San Diego County codes; and
12. The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

**MECH-2** For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal/OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon

completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal/OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal/OSHA inspection approvals.

**MECH-3** The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods

used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

**ELEC-1** Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **TRANSMISSION SYSTEM ENGINEERING** section of this document.

- A. Final plant design plans shall include:
  - 1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
  - 2. System grounding drawings.
- B. Final plant calculations must establish:
  - 1. Short-circuit ratings of plant equipment;
  - 2. Ampacity of feeder cables;
  - 3. Voltage drop in feeder cables;
  - 4. System grounding requirements;

5. Coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
  6. System grounding requirements; and
  7. Lighting energy calculations.
- C. The following activities shall be reported to the CPM in the monthly compliance report:
1. Receipt or delay of major electrical equipment;
  2. Testing or energization of major electrical equipment; and
  3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

**VERIFICATION:** At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

## **B. POWER PLANT EFFICIENCY**

### **DESCRIPTION OF MODIFICATIONS**

The amended project (PSEGS) would occupy the same location as the certified project (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The PSEGS would eliminate the use of solar trough technology and replace it with BrightSource's solar tower technology. The most relevant modifications are that the troughs and associated heat transfer fluid (HTF) would be eliminated and PSEGS will be reconfigured to utilize BrightSource's solar tower technology consisting of two solar towers, associated power blocks, and heliostat fields. The use of LPG has been replaced with natural gas, which will be delivered via a new extension of the existing SoCal Gas distribution system to the project boundary. (Ex. 1003, p 3.1-2.)

The following evidence on power plant efficiency was received into evidence on October 29, 2013: Exhibits 1003, 1017, 1076, 2000, and 2008. (10/29/13 RT 33:10 – 34:5.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that that the project would provide approximately 500 MW of electrical power, using solar energy to generate most of its capacity and natural gas auxiliary boilers to maintain steam seals, reduce startup time, and to keep the temperature of the heat transfer fluid above its freezing point. The Decision established an average steam cycle efficiency of 35 percent. The PSPP project would burn propane at a nominal rate of approximately 100,000 Million British thermal units (MMBtus) per year. The Decision specifically found that the amount of the PSPP's annual power production from fossil fuel was insignificant and the project's fuel consumption on energy supplies and energy efficiency was less than significant. The PSPP Decision found that no alternative fuel sources and generation technologies were superior to the PSPP project at meeting project objectives in an efficient manner. The Decision calculated approximately 6.0 acres per MW of power output, and, although greater land use efficiency would be achieved by building and operating a natural-gas-fired power plant rather than the PSPP, such an alternative would not achieve the basic project objective of generating electricity from the renewable energy of the sun. Also, the Commission found that although evaporative dry cooling could offer greater efficiency than dry cooling, dry cooling was shown to be a reasonable tradeoff to avoid potentially significant environmental impacts resulting from consumption of the large quantities of water required by wet cooling. The Decision concluded the PSPP would not create significant adverse direct, indirect or cumulative effects upon energy supplies or resources, require additional sources of energy supply,

or consume energy in a wasteful or inefficient manner. (PSPP Final Decision, CEC-800-2010-011, Efficiency, pp. 6-8.)

## **THE AMENDED PROJECT'S IMPACTS**

### **Project Energy Requirements and Energy Use Efficiency**

PSEGS would consume insignificant amounts of fossil fuel for power generation. It would consume fossil fuel only to reduce startup time and provide nighttime freeze protection. (Ex. 2000, p. 5.3-4.)

The project would consume natural gas at a maximum annual rate of 742,000 mmBtu. Compared to a typical fossil-fuel-fired power plant of equal capacity, and compared to the relatively considerable resources of fossil fuel in California, this rate is not significant. Natural gas is comparable in efficiency to common fossil fuels, with a heat rate that is 1.8 percent higher than propane and 9.2 percent higher than diesel fuel. (Ex. 2000, p. 5.3-4.)

The Petitioner estimates a full load thermodynamic efficiency of 43.6 percent for the proposed modified project. There are currently no legal or industry standards for measuring the efficiency of solar thermal power plants. Energy Commission Staff compares the steam cycle efficiency of PSEGS to the average efficiency of contemporary fossil fuel steam turbines currently available in the market. The efficiency figures for these turbines range from 35 to 45 percent. The project's thermal efficiency of 43.6 percent is comparable to this industry range. Coupled with the 2 percent restriction on the use of natural gas for energy generation the solar-driven thermal steam cycle efficiency provides a simple, work-proven method of electric power generation, eliminating the heat exchange losses of an intermediate HTF circuit. (Ex. 2000, p. 5.3-4.)

Based upon the evidence, we find the impact of the project's fuel consumption on energy supplies and energy efficiency would be less than significant.

### **Adverse Effects on Energy Supplies and Resources**

The project has access to an abundance of natural gas through the 200 psig gas transmission line that runs along Interstate Highway 10 (I-10). Southern California Gas Company owns this pipeline which is connected to natural gas resources from the Rocky Mountains, Canada and the southwest. The gas transmission system, of which the Interstate (I-10) pipeline is part, has the capability of carrying up to 258.33 million cubic feet per hour (mmft<sup>3</sup>/hr) from production areas in the Permian Basin of west Texas and the San Juan Basin of southern Colorado. The maximum natural gas demand from the PSEGS project would be 0.53 mmft<sup>3</sup>/hr; approximately 0.2 percent of this capacity.

PSEGS would not require the development of additional energy supply capacity. Therefore, we find that the project would not create a substantial increase in fossil fuel demand. (Ex. 2000, pp. 5.3-4 – 5.3-5.)

### **Alternative Generating Technologies**

The record contains a discussion of alternative generating technologies for PSEGS. For purposes of this analysis, natural gas, oil, coal, nuclear, geothermal, biomass, hydroelectric, wind and solar photovoltaic technologies were all considered. However, since this project would consume insignificant amounts of fossil fuel for power production, the proposed PSEGS project would not constitute a significant adverse impact on fossil fuel energy resources compared to feasible alternatives. (Ex. 2000, p. 5.3-5.)

Since solar energy is relatively inexhaustible, its consumption does not elicit the concerns associated with fossil fuel consumption. However, the extent of land area required to convert this solar energy into electricity is problematic. Setting aside hundreds or thousands of acres of land for solar power generation precludes using that land for alternative uses. (Ex. 2000, p. 5.3-5.)

A solar power project that occupies more land than another project holds the potential to produce more environmental impacts. PSEGS will produce power at the rate of 500 MW net, and generate energy at the rate of 1,412,300 MWh/year net per year, while occupying 3,794 acres which represents approximately an eight percent reduction in land use compared to the PSPP.

Staff calculates the comparative land use and energy-based efficiencies below:

**Land Use Efficiency:**  $500 \text{ MW} \div 3,794 \text{ acres} = \mathbf{0.13 \text{ MW/acre}}$ ; or

$$3,794 \text{ acres} \div 500 \text{ MW} = \mathbf{7.6 \text{ acres/MW}}$$

**Energy-Based Land Use Efficiency:**  $1,412,300 \text{ MWh/hr} \div 3,794 \text{ acres} = \mathbf{372 \text{ MWh/year}}$ . (Ex. 2000, p. 5.3-6.)

The Petitioner calculates the comparative land use and energy-based efficiencies as follows:

**Power-based efficiency:**  $500 \text{ MW} \div 3,575 \text{ acres} = \mathbf{0.14 \text{ MW/acre}}$  or  $\mathbf{7.2 \text{ acres/MW}}$

Staff calculates energy-based land use efficiency thus:

**Energy-based efficiency:** 1,360,000 MWh/year ÷ 3,575 acres = **380**

**MWh/acre-year** (Ex. 1017, p. 1-1.)

According to the evidence, the modified PSEGS will occupy approximately 7.6 acres of land per MW of power generation, or 0.13 MW/acre. The approved PSPP would occupy approximately 2,970 acres of land for the solar field, common areas, and power blocks plus approximately 926 acres of land set aside for grading and drainage which would be required for the PSPP project. Based on the total acreage (2,970+926=3,896) and the nominal gross output of 500 MW, the approved PSPP would occupy approximately 7.8 acres of land per MW of power generation, or 0.13 MW/acre. We conclude, therefore, that from a land use efficiency standpoint, the PSEGS project will be slightly more efficient than the PSPP project. (Ex. 2000, p. 5.3-6.)

### **Alternatives to Reduce Solar Land Use Impacts**

Building and operating a natural-gas-fired combined cycle power plant would yield much greater land use efficiency than any solar power plant; however, this would not achieve the basic project objective, to generate electricity from the renewable energy of the sun. (Ex. 2000, p. 5.3-6.)

The analysis in evidence shows that the PSEGS, employing BrightSource's power tower technology, will be more efficient than Ivanpah SEGS, which also employs BrightSource's power tower technology. The PSEGS land use efficiency is in the midrange of the efficiency figures entered into evidence. (Ex. 2000, p. 5.3-6.)

### **Alternative Heat Rejection System**

The Petitioner proposes to employ a dry cooling system (air-cooled condensers) as the means for rejecting power cycle heat from the steam turbines. An alternative heat rejection system would utilize evaporative cooling towers. (Ex. 2000, p. 5.3-7.)

The local climate in the project area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs relatively efficiently compared to the evaporative tower. However, at the project area (low wet-bulb temperature and high dry-bulb temperature) the air-cooled condenser performance is relatively poor compared to that of an evaporative cooling tower. Furthermore, the performance of the heat rejection system affects the performance of the steam turbine, which affects turbine efficiency and the net power output. However, an air-cooled condenser uses a much smaller amount of water compared to an evaporative cooling tower. Although power production is marginally reduced by the use of an air-cooled condenser, the benefit of reducing water consumption countervails the impact on power

production at a desert site. Even though evaporative cooling could offer greater power production resulting in higher efficiency, we find that the Petitioner's selection of dry cooling is a reasonable tradeoff because it would prevent potentially significant environmental impacts that could result from consumption of the large quantities of water required by wet cooling. (Ex. 2000, p. 5.3-7.)

## **CUMULATIVE IMPACTS**

The **PROJECT DESCRIPTION** section of this Decision provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario that forms the basis of the cumulative impact analysis for the amended PSEGS project. There are no nearby power plant projects or other projects consuming large amounts of fossil fuel that hold the potential for cumulative energy consumption impacts when aggregated with the project. The PSEGS project controls its own use of natural gas by specifying 2 percent annual energy production as a limit. Where solar tower resources share regional locales, their unimpeded access to solar radiation does not place them in competition with other solar (or non-solar) facilities within their vicinity. (Ex. 2000, p. 5.3-7.)

We find that the construction and operation of the PSEGS project will not create indirect impacts (in the form of additional fuel consumption) that would not have otherwise occurred without this project. Because the proposed modified project would consume significantly less fossil fuel than a typical fossil-fuel-fired power plant, it should compete favorably in the California power market and replace older fossil-fuel-burning power plants. The PSEGS project will, therefore, cause a positive impact on the cumulative amount of fossil fuel consumed for power generation. (Ex. 2000, p. 5.3-8.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Title 20, Cal. Code Reg. §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

PSEGS would employ an advanced solar thermal technology. Solar energy is renewable and unlimited. The PSEGS amendment eliminates the heat exchange losses of an intermediate HTF circuit, which was required for the PSPP. The PSEGS amendment improves thermodynamic efficiency and reduces water use for cooling. Further, the PSEGS would occupy less land than the PSPP, which will result in improved land use efficiency.

Solar energy is renewable and unlimited. The project would have a less than significant impact on nonrenewable energy resources. Consequently, the project would help in reducing California's dependence on fossil-fuel-fired power plants. (Ex. 2000, p. 5.3-8.)

### **PUBLIC COMMENT**

There were no comments received from the public regarding the power plant efficiency.

### **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. PSEGS would provide approximately 500 MW of electrical power using solar energy to generate 98 percent of its capacity and two percent natural gas auxiliary boilers to reduce startup time and provide nighttime freeze protection.
2. The PSPP assumed an average steam cycle efficiency of 35 percent, while the PSEGS assumes a full load thermodynamic efficiency of 43.6 percent.
3. PSEGS would consume natural gas at a maximum annual rate of 742,000 mmBtu.
4. The impact of the project's fuel consumption on energy supplies and energy efficiency is less than significant.
5. The project has access to an abundance of natural gas through the 200 psig gas transmission line, owned by Southern California Gas Company, which runs along Interstate Highway 10 (I-10).
6. The project would not create a substantial increase in fossil fuel demand.
7. The evidence contains a comparative analysis of alternative fuel sources and generation technologies, all of which are equivalent or inferior to the PSEGS project at meeting project objectives in an efficient manner.
8. The project would not constitute a significant adverse impact on fossil fuel energy resources compared to feasible alternatives.

9. The most significant environmental impacts caused by solar power plants result from occupying large expanses of land.
10. The evidentiary record contains an analysis of the project's land use impacts compared to energy output and analyses of alternative solar technologies and heat rejection systems.
11. The project would occupy approximately 7.2 acres per MW of power output.
12. Greater land use efficiency would be achieved by building and operating a natural gas-fired combined cycle power plant rather than the proposed solar project; however, such an alternative would not achieve the basic project objective of generating electricity from the renewable energy of the sun.
13. While the project would have greater land use impacts than a fossil-fuel-fired alternative project, the amended PSEGS project would occupy nearly eight percent less land than the approved PSPP.
14. Even though evaporative or wet cooling could offer greater efficiency than the PSEGS, the selection of dry cooling is a reasonable tradeoff that would prevent potentially significant environmental impacts resulting from consumption of the large quantities of water required by wet cooling.
15. There are no nearby power plant projects or other projects consuming large amounts of fossil fuel that hold the potential for cumulatively considerable energy consumption impacts when aggregated with the project.
16. The project would not contribute to cumulative land use efficiency impacts, since on a comparative basis it would occupy less land per megawatt than some other proposed solar projects with different technologies.
17. The PSEGS would cause a positive impact on the cumulative amount of fossil fuel consumed for power generation.
18. No federal, state, or local laws, ordinances, regulations, or standards apply to the efficiency of this project.
19. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## CONCLUSIONS OF LAW

1. The PSEGS would not create significant adverse direct, indirect or cumulative effects upon energy supplies or resources, require additional sources of energy supply, or consume energy in a wasteful or inefficient manner.
2. The change in the project would be beneficial to the public, Petitioner, and Intervener by providing additional local generating capacity using solar energy which is renewable and unlimited. The PSEGS eliminates the heat exchange losses of an intermediate HTF circuit, which was required for the PSPP. The PSEGS amendment would improve thermodynamic efficiency and reduce water use for cooling. Further, the PSEGS would occupy less land than the PSPP, which will result in improved land use efficiency. The project would help in reducing California's dependence on fossil-fuel-fired power plants.
3. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process because, at the time of the original licensing, the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.
4. No Conditions of Certification are required for this topic area.

## **C. POWER PLANT RELIABILITY**

### **DESCRIPTION OF MODIFICATIONS**

The amended project Palen Solar Electric Generating System (PSEGS) would occupy the same location as the certified project (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The PSEGS eliminates the use of solar trough technology and replaces it with BrightSource's solar tower technology. The most relevant modifications are that the troughs and associated heat transfer fluid (HTF) would be eliminated and PSEGS would be reconfigured to utilize BrightSource's solar tower technology consisting of two solar towers, two solar receiver steam generators (SRSG), four circulating pumps, two main boiler feedwater pumps, two back-up boiler feedwater pumps, two start-up feedwater pumps, four condensate pumps, two air-cooled condensers, two demineralization units, associated power blocks, and heliostat fields. The use of propane has been replaced with natural gas that would be delivered via a new extension of the existing SoCal Gas distribution system to the project boundary. (Ex. 1003, p 3.1-6.)

The following evidence on power plant reliability was received into evidence on October 29, 2013: Exhibits 1003, 1076, 2000, and 2008. (10/29/13 RT 34:7 – 34:25.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP observed that there are no federal, state, or local/county LORS that apply specifically to the reliability of the PSPP. Further, the Decision found that there are no National American Electric Reliability Corporation (NERC) statistics available for solar power plants. The Decision instructed that a project's reliability is acceptable if it does not degrade the reliability of the utility system to which it is connected. The availability factor for PSPP was found to be 97 percent with an annual capacity factor of approximately 26 percent. The Decision found that Implementation of a Quality Assurance/Quality Control (QA/QC) program for Palen Solar during design, procurement, construction, and operation of the plant, as well as adequate maintenance and repair of the equipment and systems, would ensure the project is adequately reliable. The Decision found that the PSPP's fuel and water supplies were reliable and that the project met industry norms for reliability during seismic events. Further, the PSPP incorporated an appropriate redundancy of function for its equipment and would provide renewable energy on hot summer days when it is most needed. Therefore, the Energy Commission concluded that the PSPP met or exceeded industry norms and would not degrade the overall reliability of the electrical system. (PSPP Final Decision, CEC-800-2010-011, **POWER PLANT RELIABILITY**, pp. 5-6.)

## **THE AMENDED PROJECT'S IMPACTS**

### **Project Availability**

The equivalent availability factor is the percentage of time the power plant is available to generate power, accounting for both planned outages (i.e. maintenance) and unplanned outages (i.e. seismic events or extreme inclement weather). For a solar power plant, the availability factor is a percentage of only daytime hours because the technology does not produce electricity at night. Measures of power plant reliability are based upon both the plant's actual ability to generate power when it is considered to be available and upon starting failures and unplanned (or forced) outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life, PSEGS is expected to operate reliably. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability requires adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. The evidence must demonstrate that the PSEGS would be as reliable as other power plants on the electric system and would not degrade system reliability. (Ex. 2000, p. 5.4-2.)

As part of its plan to provide needed reliability, the project owner seeks an amendment to operate the 500-megawatt (MW) (net power output) PSEGS, a solar thermal power plant facility employing advanced solar power tower technology. This project, using renewable solar energy, would provide dependable power to the grid, generally during the hours of peak power consumption by the interconnecting utility(ies). This project would help serve the need for renewable energy in California. The record indicates that the project owner expects the modified project to achieve an availability factor of between 92 and 98 percent. The project is anticipated to operate at an annual capacity factor of approximately 32 percent, which is equivalent to the availability and capacity factors of the PSPP. (Ex. 2000, p. 5.4-3.)

### **Equipment Availability**

Equipment availability would be ensured by adoption of appropriate QA/QC programs during the design, procurement, construction, and operation of the plant, as well as by providing for adequate maintenance and repair of the equipment and systems. (Ex. 2000, p. 5.4-3.)

The record contains a description of the PSEGS QA/QC that is typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs, and quality history would be evaluated as part of the

QA/QC program. The project owner will perform receipt inspections, test components, and administer independent testing contracts. The implementation of this program would result in typical reliability of design and construction. To ensure this implementation, we will impose appropriate conditions of certification in the section of this Decision entitled **FACILITY DESIGN**. (Ex. 2000, p. 5.4-3.)

### **Plant Maintainability**

The PSEGS project would be able to operate only when the sun is shining. Maintenance or repairs can be done when the plant is shut down at night which helps to enhance the project's reliability. The fact that the project consists of two separate units operating separately provides inherent reliability. A single equipment failure cannot disable more than one unit, thus, allowing the plant to continue to generate (at reduced output). The nature of solar thermal generating technology also provides inherent redundancy; the singular nature of the heliostats allows for reduced output generation if one heliostat, or even hundreds of heliostats, were to require service or repair. This redundancy allows service or repair to be done during sunny days when the plant is in operation if required. Major plant systems are designed with adequate redundancy to ensure their continued operation if equipment fails. Approximately 85,000 heliostats per unit provide an excess of reflective surface area to accommodate the queuing of heliostats through a standby position before focusing them on the SRSG at the top of the power tower. The heliostats would be located to accommodate: 1) specific topographical conditions for each unit site; 2) efficiency factors that account for panel shadowing, tower blockage, mirror spillage, transmittance characteristics of the mirrors and SRSG, and the characteristic cosine effect; 3) standby factor for bringing heliostats on and off line; and 4) panel reserves for handling off-line maintenance and repair. (Ex. 2000, p. 5.4-4.)

Equipment manufacturers provide maintenance recommendations for their products and the project owner will most likely base the project's maintenance program on those recommendations. Such a program encompasses both preventive and predictive maintenance techniques. Maintenance outages would be planned for periods of low electricity demand. We find the PSEGS would be adequately maintained to ensure an acceptable level of reliability. (Ex. 2000, p. 5.4-4.)

### **Fuel and Water Availability**

The long-term availability of fuel and water for cooling or process use is necessary to ensure the reliability of any power plant. The need for reliable sources of fuel and water is obvious, and in the absence of long-term availability of either resource, the service life of the plant could be curtailed, threatening both the power supply and the economic viability of the plant. (Ex. 2000, p. 5.4-4.)

The project has access to an abundance of natural gas through the 200 psig gas transmission line that runs along Interstate Highway 10. This pipeline, which is owned by SoCal Gas, is connected to natural gas resources spanning the Rocky Mountains, Canada and the southwest. The gas transmission system, of which the I-10 pipeline is a part, is an existing infrastructure that has the capability of carrying up to 6.2 billion cubic feet per day from production areas in the Permian Basin of west Texas and the San Juan Basin of southern Colorado. The maximum possible natural gas demand from the project is 0.53 million cubic feet per hour, constituting about 2 percent of this capacity. Therefore, it would be highly unlikely that the project would create a substantial increase in fossil fuel demand. Accordingly, we find that there is adequate fuel supply to meet the project's needs. (Ex. 2000, p. 5.4-4.)

PSEGS would use well water for domestic and industrial water needs including steam cycle makeup, mirror washing, service water, and fire protection water. PSEGS would be dry cooled so no water would be required for power plant cooling. The quantities of water to be consumed by the project are relatively small compared to the capacity of the resource available, and it is feasible to physically draw out the water for delivery to the project site. Thus, since this source of water supply seems adequate, we find that this source of water supply is a reliable source of water for the project (see the **SOIL AND WATER RESOURCES** section of this Decision for a further discussion of water supply). (Ex. 2000, p. 5.4-5.)

### **Power Plant Reliability in Relation to Natural Hazards**

Natural forces can threaten the reliable operation of a power plant. Tsunamis (tidal waves) and seiches (waves in inland bodies of water) are not likely to present hazards for this project, but seismic shaking (earthquakes), flooding and high winds could present credible threats to the project's reliable operation. (Ex. 2000, p. 5.4-5.)

No active faults are present within the project boundaries or within a 2.5 mile radius of the site (see the **GEOLOGY AND PALEONTOLOGY** section of this Decision). PSEGS would be designed and constructed to the latest applicable laws, ordinances, regulations and standards (LORS) and would likely perform at least as well as, and perhaps better than, existing plants in the electric power system. We have imposed conditions of certification to ensure this (see the section of this Decision entitled **FACILITY DESIGN**). In light of the general historical performance of California power plants and the electrical system in seismic events, we are satisfied that PSEGS would function reliably during earthquakes. (Ex. 2000, p. 5.4-5.)

Portions of the site lie within a 100-year or 500-year flood plain. PSEGS would be designed and built to provide adequate levels of flood resistance. We find that any threat to the functional reliability of PSEGS due to flooding is insignificant. For further

discussion, see the **WATER RESOURCES** and **GEOLOGY AND PALEONTOLOGY** sections of this Decision. (Ex. 2000, p. 5.4-5.)

High winds are common in the region of the site, which could potentially cause damage to the solar mirrors. The PSEGS features would be built to withstand wind loading, however, mirror arrays would have to be stowed during high winds to protect the mirrors. Mirror design would be in accordance with applicable LORS, including the 2010 California Building Code (**FACILITY DESIGN**). We find that the power plant's functional reliability would not be significantly impaired due to wind. (Ex. 2000, p. 5.4-6.)

### **Comparison with Existing Facilities**

NERC maintains industry statistics for availability factors (as well as other related reliability data). Because solar technology is relatively new and the technologies employed so varied, no NERC statistics are available for solar power plants. (Ex. 2000, p. 5.4-6.)

Because natural gas is the primary type of fossil fuel used in California, it is reasonable to compare the project's availability factor to the average availability factor of natural-gas-fired fossil fuel units. NERC reported an equivalent availability factor of 81.4 percent as the generating unit average during the years 2007 through 2011 for natural-gas units of 400–599 MW. The availability factor, which does not account for unplanned outages, comes in at 82.8 percent in the same period sample. (Ex. 2000, p. 5.4-6.)

The PSEGS Project would use triple-pressure (high, intermediate and low) condensing-steam turbine technology. Steam turbines incorporating this technology have been on the market for many years and are expected to exhibit typically-high availability. Also, because solar-generated steam is cleaner than combusted fossil fuel (i.e., natural gas), the PSEGS steam cycle units would likely require less frequent maintenance than units that burn fossil fuel when subject to the same operating conditions. Therefore, the project owner's expectation of an annual availability factor of 92 to 98 percent appears reasonable when compared with the NERC figures throughout North America. In fact, these machines can be expected to outperform the fleet of various turbines (mostly older and smaller) that make up NERC statistics. (Ex. 2000, p. 5.4-6.)

By factoring out the intermediate HTF circuit and taking advantage of lessons learned from 10-15 years of concentrated solar power commercial experience, the record shows that the Petitioner's 6 percent calculated increase in availability range from the PSPP's 86-92 percent to the PSEGS' 92-98 percent would not be unreasonable.

## **Cumulative Impacts**

The **PROJECT DESCRIPTION** section of this Decision provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis for the amended PSEGS Project. There are no nearby power plant projects or other projects that hold the potential for cumulative power plant reliability impacts when aggregated with the project. The Southern California Edison (SCE) Red Bluff Substation is expected to be operational in December 2013. The record establishes that there would not be any overlap of construction phase of SCE Red Bluff Substation and the PSEGS. The Red Bluff Substation would not impact the reliability of any power plant, including the proposed PSEGS and, therefore, no analysis is required. (Ex. 2000, p. 5.4-7.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs. , tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

PSEGS would employ an advanced solar thermal technology. The PSEGS shows a slight increase in availability and capacity factor over the approved PSPP and as such is more reliable than the PSPP. (Ex. 2000, p. 5.4-8.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding power plant reliability.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. No federal, state, or local/county LORS apply specifically to the reliability of the PSEGS.

2. A project's reliability is acceptable if it does not degrade the reliability of the utility system to which it is connected.
3. Because solar technology is relatively new and the technologies employed so varied among solar projects, no NERC statistics are available for solar power plants.
4. Petitioner's unchallenged prediction of the availability factor for PSEGS is 92 to 98 percent.
5. PSEGS is anticipated to operate at an annual capacity factor of approximately 32 percent.
6. Implementation of the QA/QC program for PSEGS during design, procurement, construction, and operation of the plant, as well as adequate maintenance and repair of the equipment and systems, would ensure the project was adequately reliable.
7. Appropriate conditions of certification included in the FACILITY DESIGN portion of this Decision ensure implementation of the QA/QC program for PSEGS and will ensure conformance with seismic design criteria.
8. The project's fuel supply is reliable.
9. The evidence shows that adequate, reliable supplies of water exist and are available for the project.
10. The project would likely meet industry norms for reliability, including reliability during seismic events, and would not degrade the overall electrical system.
11. The project would incorporate an appropriate redundancy of function for its equipment.
12. The nature of solar thermal generating technology provides inherent redundancy because the arrangement of heliostats would allow for reduced output generation if one (or possibly several) heliostats were to require service or repair.
13. The project would provide renewable energy on hot summer days when it is most needed.
14. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology (RAA) will have either similar or lesser impacts than the proposed PSEGS.

## CONCLUSIONS OF LAW

1. The PSEGS would not create significant adverse direct, indirect or cumulative effects upon energy supplies or resources, require additional sources of energy supply, or consume energy in a wasteful or inefficient manner.
2. The change in the project would be beneficial to the public, Petitioner, and Intervenor by providing additional local generating capacity using solar energy, which is renewable and unlimited. The RAA shows an improvement in availability and capacity factor over the approved PSPP and as such is more reliable than the PSPP. The project would help in reducing California's dependence on fossil-fuel-fired power plants.
3. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process, because at the time of the original licensing, the project was wholly-owned by Solar Millennium, whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.
4. We, therefore, conclude that the RAA would meet or exceed industry norms and not degrade the overall reliability of the electrical system.
5. There are no LORS that establish either power plant reliability criteria or procedures for attaining reliable operation.
6. No conditions of certification are required for this topic area.

## **D. TRANSMISSION SYSTEM ENGINEERING**

### **DESCRIPTION OF MODIFICATIONS**

According to the Petitioner, the PSEGS Project includes a slight re-routing of the generation tie-line near the western end of the route and at the point of interconnection with the newly-constructed Red Bluff Substation. The modified project will realign a portion of the PSEGS generation tie-line route to (1) minimize crossings over Interstate-10 (by aligning the PSEGS right-of-way to be adjacent to the NextEra Desert Sunlight generation tie-line right-of-way), and (2) interconnect the generation tie-line to a breaker position located on the west side of Red Bluff Substation (which has been assigned to PSEGS by SCE) to reduce interference with other incoming or outgoing transmission lines. The modified route is shown on Figure 2.1-3. The switchyard has been slightly modified as part of BrightSource's design. No other modifications to the PSPP Project's generation tie-line are proposed. (Ex. 1003, p. 3.2-1.)

The following evidence on transmission system engineering (TSE) was received into evidence on October 29, 2013: Exhibits 1003, 1010, 1021, 1031, 1076, 2000, and 2008. (10/29/13 RT 35:3 – 36:1.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The PSPP Project was approved as two independent concentrating solar electric generating facilities with a nominal net electrical output of 250 MW each, for a total net electrical output of 500 MW. PSPP was designed to interconnect to the SCE Red Bluff substation as the first point of interconnection. The PSPP Decision found the Conditions of Certification adequate to ensure that PSPP would not adversely impact the transmission grid. The Decision concluded that the PSPP outlet transmission lines and terminations were acceptable and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The Commission found that PSPP would not contribute to significant adverse direct, indirect, or cumulative transmission-related impacts. (PSPP Final Decision, CEC-800-2010-011, Transmission System Engineering, pp. 6-7.)

### **THE AMENDED PROJECT'S IMPACTS**

The PSEGS amendment contains no substantial changes to TSE compared to the original licensed PSPP. Undisputed evidence establishes that, except for the change in generation technology, the generation output and the interconnection facilities remain unchanged. We find that the PSEGS amendment would cause no significant impacts to the electrical transmission system. No new conditions or changes to conditions of certification are required. (Ex. 2000, p. 5.5-13.)

The PSEGS interconnection facilities including the 230 kV project switchyard, the 230 kV overhead generator tie-line, and its termination at the new SCE Red Bluff Substation, are acceptable and will comply with applicable LORS. (Ex. 2000, p. 5.5-13.)

CAISO approved the PSEGS conversion to solar tower from the original PSPP parabolic trough field technology. The California ISO's Transition Cluster Phase I and Phase II Interconnection Study Reports for the PSPP apply to the PSEGS. (Exs. 1003, p. 1-3; 2000, p. 5.5-13.)

The California ISO Phase II Study Report – Group Report in SCE's Eastern Bulk System indicates the reliable interconnection and delivery of projects in the Eastern Bulk System, which includes the PSEGS, requires the following upgrades to the existing or planned SCE transmission system:

1. Replacement or upgrade of many circuit breakers at substations in the SCE system. Circuit breaker replacement generally occurs within the fence line of existing substation facilities;
2. The use of new or expanded Special Protection System (SPS). These are essentially operating procedures that reduce the output of generators under specific conditions in order to avoid overloading transmission equipment;
3. Reconductoring of the drops of the Mira Loma–Vista 220 kV transmission line at the Vista substation. The “drops” are the portion of the line that comes into the substation; and
4. The West of Devers upgrades, including reconductoring and relocation of four 220 kV transmission lines west of the Devers substation, have been identified in SCE transmission plans for several years starting in 2007 as needed to reliably serve future loads in the SCE service area and would, therefore, be needed to maintain system reliability even if the Eastern Bulk System generators were not constructed. Also, based on the SCE Devers-Palo Verde #2 Project upgrade timeline, the construction of the Red Bluff Substation and looping the 2nd Colorado River–Devers 500 kV transmission line into the proposed Red Bluff Substation is expected to be operational by 3rd quarter of 2013. (Ex. 2000, p. 5.5-13.)

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant LORS applicable to TSE are contained in **Appendix A** of this Decision. The interconnection facilities including the PSEGS 230 kV project switchyard, generator 230 kV overhead tie line to the new SCE Red Bluff 230 kV substation, and its

termination at the new 230 kV substation are adequate in accordance with industry standards and good utility practices. Conditions of Certification **TSE-1** through **TSE-7** ensure the PSEGS complies with applicable LORS:

1. Condition of Certification **TSE-1** will ensure that the preliminary equipment is in place for construction of the transmission facilities of the PSEGS Project to comply with applicable LORS.
2. Condition of Certification **TSE-2** will ensure that the proper personnel are ready to manage and monitor the construction of the transmission facilities for the PSEGS Project to comply with applicable LORS.
3. Condition of Certification **TSE-3** will ensure that any changes to the transmission facilities would comply with applicable LORS.
4. Condition of Certification **TSE-4** will ensure that the final design of the transmission facilities would comply with applicable LORS.
5. Condition of Certification **TSE-5** will ensure that the PSEGS Project will be properly interconnected to the transmission grid. **TSE-5** also ensures that the generator output will be properly delivered to the transmission system.
6. Condition of Certification **TSE-6** will ensure that the project will synchronize with the existing transmission system and the operation of the facilities will comply with applicable LORS.
7. Condition of Certification **TSE-7** will ensure that the proposed project has been built to required specifications and the operation of the facilities will comply with applicable LORS.
8. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

The Phase II Interconnection Study indicates that the PSEGS' interconnection will comply with all NERC/WECC planning standards and California ISO reliability criteria as long as the identified Reliability Network Upgrades are implemented.

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or intervenors. Secondly, we must determine whether there has been a substantial change in

circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

The PSEGS would reduce the original PSPP footprint to further avoid environmental impacts. The PSEGS would reduce impacts by eliminating the relocation of the existing SCE 161 kV transmission line. Each Unit has an approved Power Purchase Agreement (PPA) and PSH has a Large Generator Interconnect Agreement (LGIA) for 500 MW of interconnection rights, which allow it to safely deliver the electrical output of the PSEGS to the Southern California Edison (SCE) Red Bluff Substation. The use of a fully-permitted site (as reconfigured), with an approved LGIA on BLM land designated for solar development, is a responsible approach to helping California achieve its Renewable Portfolio Standards and beyond. (Ex. 1003, pp. 1-2 – 1-3.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding the TSE.

## **FINDINGS OF FACT**

Based on the evidence of record, the Commission makes the following findings:

1. For purposes of TSE impacts analysis, the PSEGS is identical to the PSPP.
2. The PSEGS amendment would cause no significant impacts to the electrical transmission system.
3. The PSEGS would interconnect to the proposed SCE Red Bluff substation as the first point of interconnection.
4. The PSEGS interconnection facilities, including the PSEGS 230 kV project switchyard, generator 230 kV overhead tie line to the new SCE Red Bluff 230 kV substation, and its termination at the new 230 kV substation, are adequate in accordance with industry standards and good utility practices.
5. The conditions of certification are adequate to ensure that PSEGS does not adversely impact the transmission grid.
6. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. Implementation of the conditions of certification, below, ensure that the PSEGS transmission tie line complies with all applicable LORS relating to TSE.
2. The PSEGS transmission interconnection will not cause significant direct, indirect, or cumulative impacts to the electrical transmission system.

## **CONDITIONS OF CERTIFICATION**

There are no changes from the existing PSPP conditions of certification, which are reprinted here for the convenience of the parties and the public.

**TSE-1** The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

**VERIFICATION:** Prior to the start of construction of the transmission facilities, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment below). Additions and deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

Breakers
Step-up transformer
Switchyard
Busses
Surge arrestors
Disconnects
Take-off facilities
Electrical control building
Switchyard control building
Transmission pole/tower
Grounding system

**TSE-2**

Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:

- a) a civil engineer;
- b) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;
- c) a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or
- d) a mechanical engineer (Business and Professions Code, sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by **FACILITY DESIGN** Condition of Certification **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently

reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly-assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and
2. sign and stamp electrical design drawings, plans, specifications, and calculations.

**VERIFICATION:** Prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within 5 days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has 5 days in which to submit the name, qualifications, and registration number of the newly-assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within 5 days of the approval.

**TSE-3** If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (2001 California Building Code, chapter 1, section 108.4, approval required; chapter 17, section 1701.3, *Duties and Responsibilities of the Special Inspector*; appendix, chapter 33, section 3317.7, *Notification of Noncompliance*). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and refer to this condition of certification.

**VERIFICATION:** The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within 5 days, the reason for the disapproval, along with the revised corrective action required to obtain the CBO's approval.

**TSE-4** For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

- a) receipt or delay of major electrical equipment;
- b) testing or energization of major electrical equipment; and
- c) the number of electrical drawings approved, submitted for approval and still to be submitted.

**VERIFICATION:** Prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

**TSE-5** The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO. Once approved, the project owner shall inform the CPM and CBO of any anticipated changes to the design, and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

- a) The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC); title 8 of the California Code and Regulations; articles 35, 36, and 37 of the High Voltage Electric Safety Orders; California ISO Standards; National Electric Code (NEC); and related industry standards.

- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
- d) The project conductors shall be sized to accommodate the full output of the project.
- e) Termination facilities shall comply with applicable SCE interconnection standards.
- f) The project owner shall provide to the CPM:
  - i) The Special Protection System (SPS) sequencing and timing if applicable;
  - ii) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable; and
  - iii) A copy of the executed LGIA signed by the California ISO and the project owner.

**VERIFICATION:** Prior to the start of construction or start of modification of transmission facilities, the project owner shall submit to the CBO for approval:

1. Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); California Code of Regulations, title 8; articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*; California ISO standards; National Electric Code (NEC); and related industry standards for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment;
2. For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions"<sup>1</sup> and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety

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<sup>1</sup> Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

Code (NESC); California Code of Regulations, title 8; articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*; California ISO standards; National Electric Code (NEC); and related industry standards;

3. Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by the requirements of Condition of Certification **TSE-5** a) through f);
4. The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM;
5. A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable; and
6. A copy of the executed LGIA signed by the California ISO and the project owner.

Prior to the start of construction of or modification of transmission facilities, the project owner shall inform the CBO and the CPM of any anticipated changes to the design that are different from the design previously submitted and approved and shall submit a detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change to the CPM and CBO for review and approval.

**TSE-6** The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California Transmission System:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

**VERIFICATION:** The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO 1 week prior to initial synchronization with the grid. The project owner shall contact the California ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least 1 business day prior to synchronizing the facility with the grid for testing. A report of conversation with the California ISO shall be provided electronically to the CPM 1 day before synchronizing the facility with the California Transmission System for the first time.

**TSE-7** The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, California Code of Regulations, title 8, articles 35, 36 and 37 of the “High Voltage Electric Safety Orders,” applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

**VERIFICATION:** Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

1. “As built” engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, California Code of Regulations, title 8, articles 35, 36, and 37 of the “High Voltage Electric Safety Orders,” and applicable interconnection standards, NEC, related industry standards.
2. An “as built” engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. “As built” drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the “Compliance Monitoring Plan.”
3. A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

## **E. TRANSMISSION LINE SAFETY AND NUISANCE**

### **DESCRIPTION OF MODIFICATIONS**

The proposed Palen Solar Electric Generating System (PSEGS) 230-kV tie-in line consists of a new, single-circuit 230-kV overhead transmission line extending the 10 miles from the on-site project switchyard to the Red Bluff Substation under construction and an on-site 230-kV switchyard from which the conductors would extend to the Red Bluff Substation. The Red Bluff Substation is currently being built by Southern California Edison (SCE) near the community of Desert Center. Since it is being built on federal land and within SCE's service area, the substation would be under the jurisdiction of the California Public Utilities Commission (PUC) and the Bureau of Land Management (BLM). (Ex. 2000, p. 4.11-4.)

The overhead conductors will be aluminum steel-reinforced cables supported on steel pole structures placed approximately 1,100 feet apart and with a maximum height of 120 feet as typical of similar SCE lines. The width of the right-of-way will be approximately 120 feet. About 38 of these poles would be required in addition to poles for supporting turning points. (Ex. 2000, p. 4.11-4.)

The PSEGS would require a slight re-routing of the generation tie-line near the western end of the route around the new Red Bluff Substation. The realignment will not significantly affect the levels of the field and non-field impacts from the PSEGS as compared to the PSPP. (Ex. 2000, p. 4.11-4.)

The following evidence on transmission line safety and nuisance was received into evidence on October 29, 2013: Exhibits 1003, 1076, 2000, 2003, and 2008. (10/29/13 RT 36:2 – 36:20.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP described the onsite switchyard and 230-kV single-circuit overhead transmission tie line extending from the switchyard to SCE's planned Red Bluff Substation. The evidentiary record included analyses of potential impacts from the PSPP generation tie line involving aircraft collisions, interference with radio frequency communication, audible noise, hazardous shocks, nuisance shocks, fire danger, and EMF exposure. The PSPP Decision found no residences along the route of the project's new generation tie line and that electromagnetic fields (EMF) pose no significant health hazard to humans. The project's generation tie line will incorporate standard EMF-reducing measures established by the CPUC and used by SCE and the project owner will provide field intensity measurements before and after line energization to assess EMF contributions from the project-related current flow. PSPP's generation tie line will not result in significant adverse

environmental impacts to public health and safety or cause significant direct, indirect, or cumulative impacts as a result of aviation collisions, radio frequency communication interference, fire danger, nuisance or hazardous shocks, or electric and magnetic field exposure (EMF). The PSPP Decision concluded that implementation of the conditions of certification would ensure that the PSPP Project's transmission tie line complies with all applicable laws, ordinances, regulations, and standards (LORS) relating to transmission line safety and nuisance as identified in the Decision. The California Energy Commission determined that the PSPP Project's transmission line would not create a significant direct, indirect, or cumulative impact due to tie line safety and nuisance factors. (PSPP Final Decision, CEC-800-2010-011, Transmission Line Safety and Nuisance, pp. 5-6.)

### **THE AMENDED PROJECT'S IMPACTS**

As previously noted, the point of connection with the SCE grid would be SCE's Red Bluff Substation approximately 10 miles to the west and currently under construction with completion expected by the end of 2013. Since this SCE substation would be under the jurisdiction of the CPUC, it would be designed, built, and operated according to SCE guidelines in keeping with existing LORS. (Ex. 2000, p. 4.11-5.)

The PSEGS Project site is open desert land with no existing structures other than SCE's 161-kV Eagle Mountain-Blythe transmission that traverses the southwestern portion. There are only two residences within two miles of the project site and the transmission line. The closest is approximately 1,000 feet from the site boundary. Since both buildings are currently unoccupied and there is very little local residential land use, there would not be the type of residential field exposures that have been of health concern in recent years over power line operation. (Ex. 2000, p. 4.11-5.)

Potential impacts involve aircraft collisions, interference with radio frequency communication, audible noise, hazardous shocks, nuisance shocks, fire danger, and EMF exposure. (Ex. 2000, pp. 4.11-5 – 4.11-10.)

#### **Aviation Safety**

For the PSEGS, any potential hazard to area aircraft would relate to the potential for collision in the navigable airspace. Regulations require FAA notification in cases of structures over 200 feet from the ground. Notification is also required if the structure is to be below 200 feet in height, but would be located within the restricted airspace in the approaches to public or military airports. For airports with runways longer than 3,200 feet, the restricted space is defined by the FAA as an area extending 20,000 feet from the runway. For airports with runways of 3,200 feet or less, the restricted airspace would be an area that extends 10,000 feet from this runway. For heliports, the restricted space is an area that extends 5,000 feet. (Ex. 2000, p. 4.11-5.)

The closest operational airport to the PSEGS Project is Blythe Airport, approximately 30 miles east of the project site, too far away for the PSEGS transmission line to pose an aviation hazard to utilizing aircraft. Also, the maximum height of 120 feet for the proposed line support structures is far less than the 200 feet threshold that constitutes an aviation hazard according to FAA requirements. (Ex. 2000, p. 4.11-5.)

The evidence shows that (a) the physical dimensions of the PSEGS Project's line structures are less than normally associated with collision hazards and (b) the distances from area aviation centers are less than those related to the same collision hazards. Therefore, we do not find it necessary to impose any aviation-related conditions of certification because the PSEGS transmission lines will have no significant impact on aviation safety. (Ex. 2000, p. 4.11-5.)

### **Interference with Radio-Frequency Communication**

Transmission line-related radio-frequency interference is one of the indirect effects of line operation and is produced by the physical interactions of line electric fields. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. When generated, such noise manifests itself as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The level of any such interference usually depends on the magnitude of the electric fields involved and the distance from the line. The potential for such impacts is, therefore, minimized by reducing the line electric fields and locating the line away from inhabited areas. (Ex. 2000, p. 4.11-6.)

The PSEGS transmission line will be built and maintained in keeping with standard SCE practices that minimize surface irregularities and discontinuities. Moreover, the evidence indicates that the potential for such corona-related interference is usually of concern for lines of 345 kV and above, but not for 230-kV lines such as the PSEGS line. The line's proposed low-corona designs are used for all SCE lines of similar voltage rating to reduce surface-field strengths and the related potential for corona effects. Since the proposed line would traverse an uninhabited open space, we find that there will be no corona-related radio-frequency interference or related complaints. We find that the PSEGS will cause no significant impact to radio-frequency communication and we do not impose any related conditions of certification. (Ex. 2000, p. 4.11-6.)

## **Audible Noise**

The noise-reducing designs related to electric field intensity are not specifically mandated by federal or state regulations in terms of specific noise limits. As with radio noise, such noise is limited instead through design, construction, or maintenance practices established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability. Audible noise usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying, or hissing sound or hum, especially in wet weather. Since the noise level depends on the strength of the line electric field, the potential for perception can be assessed from estimates of the field strengths expected during operation. The record indicates that such noise is usually generated during rainfall, but mainly from overhead lines of 345 kV or higher. It is, therefore, not generally expected at significant levels from lines of less than 345 kV as proposed for PSEGS. Research by the Electric Power Research Institute has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a right-of-way of 100 feet or more. Since the low-corona designs for the PSEGS Project are also aimed at minimizing field strengths, we find that line operation will not add significantly to current background noise levels in the project area. For an assessment of the noise from the transmission line and related facilities, please refer to the **NOISE AND VIBRATION** section of this Decision. (Ex. 2000, p. 4.11-6.)

## **Fire Hazards**

The fire hazards considered in this section and related LORS include sparks from conductors of overhead lines, or fires that could result from direct contact between the line and nearby trees and other combustible objects. (Ex. 2000, p.4.11-7.)

Standard fire prevention and suppression measures for similar SCE lines will be implemented by the project owner for the PSEGS Project line. Such measures are required under section 4292 of the Public Resources Code, and section 1250 of title 14 of the California Code of Regulations. The project owner's compliance with the clearance-related aspects of the California Public Utility Commission's General Order 95 (GO-95) is an important part of this mitigation approach. Existing Condition of Certification **TLSN-3** will remain in effect to ensure PSEGS' compliance with all aspects of their intended fire prevention program. (Ex. 2000, p. 4.11-7.)

## **Hazardous Shocks**

Hazardous shocks result from direct or indirect contact between an individual and the energized line, whether overhead or underground. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines. (Ex. 2000, p. 4.11-7.)

There are no design-specific federal regulations established to prevent hazardous shocks from overhead power lines. Safety is assured within the industry from compliance with the requirements specifying the minimum national safe operating clearances applicable in areas where the line might be accessible to the public. Implementation of the GO-95- and GO-128-related measures against direct contact with the energized line would serve to minimize the risk of hazardous shocks for the PSEGS Project. Existing Condition of Certification **TLSN-1** is adequate to ensure implementation of the necessary mitigation measures. We find the risk of hazardous shocks is below significance. (Ex. 2000, p. 4.11-7.)

## **Nuisance Shocks**

Nuisance shocks are caused by current flow at levels generally incapable of causing significant physiological harm. They result mostly from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line's EMF. (Ex. 2000, p. 4.11-7.)

There are no design-specific federal or state regulations to limit nuisance shocks in the transmission line environment. For modern overhead high-voltage lines, such shocks are effectively minimized through grounding procedures specified in the National Electrical Safety Code (NESC) and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE). For the PSEGS Project line, the project owner will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. (Ex. 2000, p. 4.11-7.)

The potential for nuisance shocks around the proposed line will be minimized through standard industry grounding practices. Existing Condition of Certification **TLSN-4** will ensure compliance with standard industry grounding practices. We find the risk of nuisance shocks is below significance. (Ex. 2000, p. 4.11-7.)

## **Electric and Magnetic Field Exposure (EMF)**

While there is considerable uncertainty about EMF health effects, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically-significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- There are measures that can be employed for field reduction, but they can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures. (Ex. 2000, p. 4.11-8.)

In California, the CPUC (which regulates the installation and operation of many high-voltage lines owned and operated by investor-owned utilities) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It requires each utility within its jurisdiction to establish EMF-reducing measures and incorporate such measures into the designs for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Publicly-owned utilities, which are not within the jurisdiction of the CPUC, voluntarily comply with these CPUC requirements. (Ex. 2000, p. 4.11-8.)

In keeping with this CPUC policy, we require a showing that each overhead line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. (Ex. 2000, p. 4.11-8.)

Since the CPUC currently requires that most new lines in California be designed according to the EMF-reducing guidelines of the electric utility in the service area involved, their fields are required under this CPUC policy to be similar to fields from similar lines in that service area. Designing the PSEGS Project line according to existing SCE field strength-reducing guidelines constitutes compliance with the CPUC requirements for line field management. (Ex. 2000, p. 4.11-8.)

Since there are no residences in the immediate vicinity of the PSEGS Project's realigned transmission line, there would be no long-term residential EMF exposures of the sort responsible for the health concern of recent years. The only project-related EMF exposures of potential significance would be the short-term exposures of plant workers, regulatory inspectors, maintenance personnel, visitors, or other individuals in the vicinity of the line. These types of exposures are short term and well understood as not significantly related to the health concern. (Ex. 2000, p. 4.11-9.)

As with similar SCE lines, specific field strength-reducing measures will be incorporated into the PSEGS line's design to ensure the field strength minimization currently required by the CPUC in light of the concern over EMF exposure and health. The field reduction measures to be applied include increasing the distance between the conductors and the ground to an optimal level; reducing the spacing between the conductors to an optimal level; minimizing the current in the line; and, arranging current flow to maximize the cancellation effects from interacting of conductor fields. (Ex. 2000, p. 4.11-10.)

Since the PSEGS' transmission line route will have no residences in the immediate vicinity of the right-of-way, the long-term residential field exposures at the root of the health concern of recent years will not be significant. The requirements in existing Condition of Certification **TLSN-2** for field strength measurements will remain unchanged to validate the project owner's assumed reduction efficiency. (Ex. 2000, p. 4.11-10.)

### **Closure and Decommissioning Impacts and Mitigation**

If the proposed PSEGS were to be closed and decommissioned, and all related structures are removed as described in the **PROJECT DESCRIPTION** section, the minimal area aviation risk and electric shocks and fire hazards from the physical presence of this tie-in line would be eliminated. Decommissioning and removal would also eliminate the transmission line's field impacts assessed in this analysis in terms of nuisance shocks, radio-frequency impacts, audible noise, and EMF. Since the line will be designed and operated according to existing SCE guidelines, these impacts would be as expected for SCE lines of the same voltage and current-carrying capacity and, therefore, at levels reflecting compliance with existing health and safety LORS. (Ex. 2000, p. 4.11-10.)

### **Cumulative Impacts**

The impacts from a specific project may, even at insignificant levels, combine with similarly low-level impacts from other nearby projects to produce the total effects that could be characterized as cumulatively considerable. For the proposed and similar projects, being "cumulatively considerable" means that the incremental effects of an individual project would be significant when viewed in connection with the effects from past, existing, or future projects (California Code Regulations, title 14, section 15130). NEPA, for example, states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR §1508.7.)

When field intensities are measured or calculated for a specific location they reflect the interactive and therefore cumulative effects of fields from all contributing conductors. Such interactions could be additive or subtractive depending on prevailing conditions. (Ex. 2000, p.4.11-11.)

The existing or future area sources of the field and non-field impacts of concern in this analysis are identified in the record. The sources were identified in terms of source and distance from the proposed project line. Their respective intensities and contributions to cumulative impacts would diminish with distance from each source. These individual impacts would be reflected in the levels estimated for the proposed line at the points of maximum interest. Since the proposed project line would be designed, built, and operated according to applicable field-reducing SCE guidelines (as currently required by the CPUC for effective field management), any contribution to cumulative area fields should be at levels expected for SCE lines of similar voltage and current-carrying capacity. It is this similarity in intensity that constitutes compliance with current CPUC requirements for EMF management. The actual field strengths and contribution levels for the PSEGS line design will be assessed from the results of the field strength measurements specified in existing Condition of Certification **TLSN-2**. We find that the field and non-field impacts of the PSEGS transmission lines will not be cumulatively considerable. (Ex. 2000, p. 4.11-11.)

#### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

As previously noted, current CPUC policy on safe EMF management requires that any high-voltage line within a given area be designed to incorporate the field strength-reducing guidelines of the main area utility lines to be interconnected. The utility in this case is SCE. Since the proposed project 230-kV line and related switchyard will be designed according to the respective requirements of the LORS listed in **Appendix A** (under Transmission Line Safety and Nuisance), and operated and maintained according to current SCE guidelines on line safety and field strength management, we consider the PSEGS design and operational plan to be in compliance with the health and safety requirements relevant to this analysis. The actual contribution to the area's field exposure levels will be assessed from results of the field strength measurements required in existing Condition of Certification **TLSN-2**. (Ex. 2000, p. 4.11-12.)

#### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or interveners. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found

this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Since the proposed PSEGS tie-in line will pose specific, although insignificant, risks of the field and non-field effects, these effects are equivalent to those of the PSPP. The construction and operation of the PSEGS will not yield any greater benefits regarding the effort to minimize any human risks from these impacts. (Ex. 2000, p.4.11-12.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding the transmission line safety and nuisance.

## **FINDINGS OF FACT**

Based on the evidence of record, the Commission makes the following findings:

1. The amended PSEGS transmission facilities consist of a new single-circuit 230-kV overhead transmission line extending the 10 miles from the on-site project switchyard to the SCE Red Bluff Substation (currently under construction) and an on-site 230-kV switchyard from which the conductors would extend to the Red Bluff Substation.
2. The evidentiary record includes analyses of potential impacts from the PSEGS Project's generation tie line involving aircraft collisions, interference with radio frequency communication, audible noise, hazardous shocks, nuisance shocks, fire danger, and EMF exposure.
3. The line crosses uninhabited desert land and there are no residences along the route of the project's new generation tie line.
4. The available scientific evidence does not establish that EMF poses a significant health hazard to humans.
5. The electric and magnetic fields generated by the PSEGS project's generation tie line will be managed to the extent the CPUC considers appropriate, based on available health effects information.
6. The PSEGS generation tie line will comply with existing LORS for public health and safety.
7. The PSEGS generation tie line will incorporate standard EMF-reducing measures established by the CPUC and used by SCE.

8. The project owner will provide field intensity measurements before and after line energization to assess EMF contributions from the project-related current flow.
9. The new generation tie line will not result in significant adverse environmental impacts to public health and safety or cause significant direct, indirect, or cumulative impacts resulting from aviation collisions, radio frequency communication interference, fire danger, nuisance or hazardous shocks, or EMF exposure.
10. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

### **CONCLUSIONS OF LAW**

1. Implementation of the conditions of certification, below, will ensure that the PSEGS transmission tie line complies with all applicable LORS relating to transmission line safety and nuisance as identified in the pertinent portion of **Appendix A** of this Decision.
2. The PSEGS Project's transmission line will not create a significant direct, indirect, or cumulative impact due to transmission line safety and nuisance factors.

### **Conditions of Certification**

**TLSN-1** The project owner shall construct the proposed project transmission line according to the requirements of: (a) California Public Utility Commission's GO-95, GO-52, GO-131-D, GO-128, title 8, and Group 2; (b) the High Voltage Electrical Safety Orders, sections 2700 through 2974 of the California Code of Regulations; and (3) Southern California Edison's EMF reduction guidelines.

**VERIFICATION:** At least 30 days prior to start of construction of the transmission line or related structures and facilities, the project owner shall submit to the Compliance Project Manager a letter signed by a California-registered electrical engineer affirming that the lines will be constructed according to the requirements stated in the condition.

**TLSN-2** The project owner shall use a qualified individual to measure the strengths of the electric and magnetic fields from the line at the points of maximum intensity along the route for which the project owner provided specific estimates. The measurements shall be made before and after energization according to the American National Standard Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) standard procedures. These measurements shall be completed no later than six months after the start of operations.

**VERIFICATION:** The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements.

**TLSN-3** The project owner shall as part of its intended fire prevention program ensure that the right-of-way of the transmission line is kept free of combustible material, as required under the provisions of section 4292 of the Public Resources Code and California Code of Regulations, title 20, section 1250.

**VERIFICATION:** During the first 5 years of plant operation, the project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way and provide such summaries in the Annual Compliance Report on transmission line safety and nuisance-related requirements.

**TLSN-4** The project owner shall ensure that all permanent metallic objects within the right-of-way of the project-related line are grounded according to industry standards regardless of ownership.

**VERIFICATION:** At least 30 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

## V. PUBLIC HEALTH AND SAFETY

### A. GREENHOUSE GAS EMISSIONS

#### DESCRIPTION OF MODIFICATIONS

The Palen Solar Electric Generating System (PSEGS) project owner has petitioned to amend the Palen Solar Power Plant (PSPP) to replace the parabolic trough solar collection system and associated heat transfer fluid (HTF) system previously approved by the California Energy Commission with solar tower technology. The PSEGS solar tower technology would make steam to run a steam turbine generator by using a field of heliostats (elevated mirrors, each approximately 12 feet tall, mounted on pylons and guided by a sun tracking system) to focus the sun's rays on a solar receiver steam generator mounted atop a 750-foot solar tower located near the center of each solar field. The PSEGS Project is comprised of two solar plants, each of which would have 250 MW of capacity, totaling 500 MW for the facility. As a solar project, its greenhouse gas (GHG) emissions would be considerably less than the existing statewide average GHG emissions per unit of generation and considerably less than the GHG emissions from existing fossil-fuel-fired power plants providing generation to California and, thus, would contribute to continued reduction of GHG emissions in the interconnected California and the western United States electricity systems. (Ex. 2000, p. 4.1-89.)

The operating emissions of the PSEGS were provided by the Petitioner in the amendment application. Operating emissions for the previously approved PSPP were estimated at 14,818 metric tons of carbon dioxide equivalent per year. The Petitioner's estimated emissions for PSEGS are 44,720 metric tons of carbon dioxide equivalent emissions per year (without support on-site vehicles) and 77,720 (with on-site vehicles) as shown in **Greenhouse Gas - Table 2** below. This is due to increased fuel use in the PSEGS auxiliary and nighttime preservation boilers compared to the approved PSPP, which did not have these additional boilers. (Ex. 2000, p. 4.1-89.)

The following evidence on Air Quality (GHG) was received into evidence on November 22, 2013: Exhibits 1003, 1007, 1018, 1021, 1041, 1043, 1045, 1054, 1056, 1057, 1079, 2006, 2008, 2013, 2014, 2015, 2016<sup>1</sup>, 3065, 3066, 3067, 3068, 3069, 3070, 3071, 3072, 3073, 3074, 3075, 3076, 3077, 3078, 3079, 3080, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3090, 3091. (11/22/13 RT 37:9 – 45:2; 11/25/13 RT 8:8 -9:21.)

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<sup>1</sup> We held the record open to receive Exhibit 2016 after the close of the evidentiary record (11/22/13 RT pdf 45:15-18). We take official notice of Exhibit 2016, the Final Determination of Compliance from SCAQMD.

## **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that the GHG emissions from PSPP Project construction were likely to be 101,000 MTCO<sub>2</sub> equivalent (“MTCO<sub>2</sub>E”) during the 39-month construction period. The Decision noted that there is no numerical threshold of significance under CEQA for construction-related GHG emissions and found that the PSPP will use best practices to control its construction-related GHG emissions and reduce emissions below significance. The Decision recognized that state government has a responsibility to ensure a reliable electricity supply consistent with environmental, economic, and health and safety goals. The Decision recognized further that California utilities are obligated to meet whatever demand exists from any and all customers. The PSPP Decision found that the maximum annual equivalent CO<sub>2</sub> emissions from the PSPP operation would be 14,818 MTCO<sub>2</sub>E, which constituted an emissions performance factor of 0.015 MTCO<sub>2</sub>E / MWh. The Decision determined the PSPP to be compliant with the SB 1368 EPS. The Decision specifically found no evidence in the record that construction or operation of PSPP would be inconsistent with the loading order requiring California utilities to obtain their power first from the implementation of all feasible and cost-effective energy efficiency and demand response, then from renewables and distributed generation, and, finally, from the most efficient available fossil-fuel fired generation and infrastructure improvement. The Energy Commission found that the PSPP would displace generation from higher GHG-emitting power plants and replace power from coal-fired power plants, which will be unable to contract with California utilities under the SB 1368 EPS, and from once-through cooling power plants that must be retired. The Decision concluded that PSPP’s operation would reduce overall GHG emissions from the electricity system and would not cause a significant adverse environmental impact. (PSPP Final Decision, CEC-800-2010-011, GHG Emissions, pp. 14-16.)

### **Air Quality GHG Analysis**

California is actively pursuing policies to reduce GHG emissions that include adding low GHG-emitting renewable electricity generation resources to the system. The GHGs evaluated in this analysis include carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFC), and perfluorocarbons (PFC). The CO<sub>2</sub> emissions are far and away the most common of these emissions and, as a result, even though the other GHGs may have a greater impact on climate change on a per-unit basis due to their greater global warming potential (as described more fully below), GHG emissions are often “normalized” in terms of metric tons of CO<sub>2</sub>-equivalent (MTCO<sub>2</sub>E) for simplicity. Global warming potential (GWP) is a relative measure, compared to carbon dioxide, of a compound’s ability to warm the planet, taking into account each compound’s expected residence time in the atmosphere. By

convention, carbon dioxide is assigned a GWP of 1. In comparison, for example, methane has a GWP of 21, which means that it has a global warming effect 21 times greater than carbon dioxide on an equal-mass basis. The carbon dioxide equivalent (CO<sub>2</sub>E) for a source is obtained by multiplying each GHG by its GWP and then adding the results together to obtain a single, combined emission rate representing all GHGs in terms of CO<sub>2</sub>E. (Ex. 2000, p. 4.1-91.)

GHG emissions are not included in the class of pollutants traditionally called “criteria pollutants.” Since the impact of the GHG emissions from a power plant’s operation has global rather than local effects, those impacts should be assessed not only by analysis of the plant’s emissions, but also in the context of the operation of the entire electricity system of which the plant is an integrated part. Furthermore, the impact of the GHG emissions from a power plant’s operation should be analyzed in the context of applicable GHG laws and policies, especially Assembly Bill (AB) 32, California’s Global Warming Solutions Act of 2006 (now codified in California Health and Safety Code § 38500 et seq.). (Ex. 2000, p. 4.1-91.)

The record contains a detailed explanation of the history, scientific findings and policies arising from global climate change. Predicted changes include a rise in temperature and sea levels, heat-waves, heat-related deaths, a decrease in precipitation, reduction of water supply, increased ozone formation, and increased wildfires. There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps substantially) to that change. Man-made emissions of GHGs, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. (Ex. 2000, pp. 4.1-91 – 4.1-92.)

The record summarizes federal, state and decisional laws responding to GHG emissions and describes the various strategies employed by the California Energy Commission, the California Air Resources Board (ARB) and other agencies working together to control GHG emissions. In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32) (California Health and Safety Code § 38500 et seq.). It requires the ARB to adopt standards to reduce statewide GHG emissions to GHG emissions levels that existed in 1990, with such reductions to be achieved by 2020. Among a wide variety of strategic actions designed to attain the goals of AB 32, ARB approved a scoping plan that includes a 33 percent renewables portfolio standard (RPS), aggressive energy efficiency targets, and a cap-and-trade program that includes the electricity sector. The PSEGS Project would contribute to this goal. (Ex. 2000, pp. 4.1-93 – 4.1-95.)

SB 1368, enacted in 2006 and codified in Public Utilities Code § 8340 et seq., along with regulations adopted by the Energy Commission and the CPUC, prohibits California utilities from entering into long-term commitments with any base-load facilities that

exceed the Emission Performance Standard (EPS) of 0.5 metric tonnes CO<sub>2</sub> per megawatt hour (1,100 pounds CO<sub>2</sub>/MWh). The EPS only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent. The SB 1368 EPS applies to base-load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California. If a project, in-state or out of state, plans to sell base-load electricity to California utilities, those utilities will have to demonstrate that the project meets the EPS. Base-load units are defined as units that are expected to operate at a capacity factor higher than 60 percent. Compliance with the EPS is determined by dividing the annual average carbon dioxide emissions by the annual average net electricity production in MWh. This determination is based on capacity factors, heat rates, and corresponding emissions rates that reflect the expected operations of the power plant and not on full-load heat rates. (Ex. 2000, pp. 4.1-95 – 4.1-96.)

In addition to these programs, California is involved in the Western Climate Initiative (WCI), a multi-state and international effort to establish a cap-and-trade market to reduce GHG emissions in the Western United States and the Western Electricity Coordinating Council (WECC). PSEGS would be required to participate in California's GHG cap-and-trade program. This cap-and-trade program is part of a broad effort by the State of California to reduce GHG emissions as required by AB 32, which is being implemented by ARB. As currently proposed, market participants such as PSEGS would be required to report their GHG emissions and to obtain GHG emissions allowances (and offsets) for those reported emissions by purchasing allowances from the capped market and offsets from outside the AB 32 program. As new participants enter the market and as the market cap is ratcheted down over time, GHG emission allowance and offset prices will increase encouraging innovation by market participants to reduce their GHG emissions. Thus, PSEGS, as a GHG cap-and-trade participant, would be consistent with California's AB 32 Program, which is a statewide program coordinated with a region wide program to reduce California's GHG emissions to 1990 levels by 2020. (Ex. 2000, pp. 4.1-96 – 4.1-97.)

## **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

### **Project Construction**

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include GHGs. The construction would last approximately 33 months. The GHG emissions estimate for the entire construction period provided by the project owner is below in **Greenhouse Gas -**

**Table 1.** Construction period GHG emissions average 16,485 MTCO<sub>2</sub>E per year (45,335 MTCO<sub>2</sub>E/33 months X 12 months in a year). (Ex. 2000, p. 4.1-97.)

**Greenhouse Gas - Table 1  
Estimated PSEGS Potential Construction Greenhouse Gas Emissions**

Construction Element	CO <sub>2</sub> -Equivalent (MTCO <sub>2</sub> E) <sup>1,2,3</sup>
On-Site Construction Equipment (includes delivery and hauling vehicles)	31,560
On-Site Motor Vehicles (LTDs)	83
Off-Site Motor Vehicles	13,692
Construction Total (33 months)	45,335

Notes:

1 - One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

2 - The vast majority of the CO<sub>2</sub>E emissions, over 99%, are CO<sub>2</sub> from these combustion sources.

3 - Values shown per period for construction. Days per period: - 21 days per month at 33 months = 693 days total.

Source: (Ex. 2000, p. 4.1-97.)

The impact of GHG emissions caused by this solar facility is characterized by considering how the power plant would affect the overall electricity system. The integrated electricity system depends on non-fossil and fossil-fueled generation resources to provide energy and satisfy local capacity needs. (Ex. 2000, p. 4.1-99.)

Evidence indicates that the GHG emission increases from construction activities would not be CEQA significant for several reasons. First, the period of construction would be short term, and the emissions intermittent, during that period, and not ongoing during the life of the proposed modified project. Second, best practices control measures such as limiting idling times and requiring, as appropriate, equipment that meets the latest emissions standards, further minimize GHG emissions, since the use of newer equipment would increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates, which will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. Finally, these temporary GHG emissions are necessary to create this renewable energy source that would provide electricity with a very low GHG emissions profile, and the construction emissions would be more than offset by the reduction in fossil-fuel-fired generation that would be enabled by the PSEGS Project. If the project construction emissions were distributed over the estimated 30-year life of the project, they would only increase the project life time facility GHG emissions rate by 0.002 MT CO<sub>2</sub>E per MWh. Therefore, GHG emission increases from the PSEGS construction activities would be less than significant. (Ex. 2000, p. 4.1-100.)

## **Project Operations**

Shown below in **Greenhouse Gas - Table 2** is the operating PSEGS emissions data for GHGs including carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFC), and perfluorocarbons (PFC). The primary sources that would cause GHG emissions would be from power block auxiliary boilers and nighttime preservation boilers, maintenance activities including mirror cleaning and minimal undesired vegetation removal, weekly testing of the emergency generator and firewater pump, daily operation of each boiler (5 hours per day of operation plus additional hours for startup of each auxiliary boiler, and 12 to 16 hours per day of operation, plus 1 hour for startup of each nighttime boiler), and employee commute trips. (Ex. 2000, p. 4.1-98.)

**Greenhouse Gas - Table 2  
PSEGS Estimated Potential Greenhouse Gas (GHG) Emissions**

Emitting Source	Maximum Emissions, metric tonnes/yr				CO <sub>2</sub> -equivalent (MTCO <sub>2</sub> E <sup>a</sup> per year)
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	SF <sub>6</sub>	
Auxiliary Boilers <sup>c</sup>	37,658	0.72	0.04	--	37,659
Nighttime Preservation Boilers	5,922	0.1	0.02	--	5,922
Power Block Emergency Generator	778	0.024	7.6E-3	--	778
Common Area Emergency Generator	45	1.7E-03	3.8E-3	--	45
Power Block Fire Pump Engine	152	4.0E-03	1.4E-03	--	152
Common Area Fire Pump Engine	76	2.0E-03	7.0E-04	--	76
WSACs	0	0.00	0.00	--	0
Equipment Leakage (SF <sub>6</sub> )	--	--	--	2.0E-03	2.0E-03
<b>Total</b>	<b>44,631</b>	<b>0.8517</b>	<b>0.0735</b>	<b>2.0E-03</b>	<b>44,631</b>
Global warming potential multiplier	1x	21x	310x	23,900x	
<b>Total Project GHG Emissions – MTCO<sub>2</sub>E<sup>b</sup></b>	<b>44,631</b>	<b>17.89</b>	<b>22.79</b>	<b>47.8</b>	<b>44,720</b>
On-Site Maintenance Vehicles <sup>d</sup>	--	--	--	--	33,000
<b>MTCO<sub>2</sub></b>	<b>44,631</b>	<b>MTCO<sub>2</sub>E<sup>b</sup></b>			<b>77,720</b>
Facility MWh per year <sup>e</sup>	1,412,300				1,412,300
Facility CO <sub>2</sub> EPS (MTCO <sub>2</sub> /MWh)	0.032 <sup>g</sup>	Facility GHG Performance (MTCO <sub>2</sub> E/MWh)			0.055 <sup>f</sup>

Source: Palen 20113ff, Table4.1A-13 Palen Source Emissions, SCAQMD 2013c, and staff estimate for employee vehicles.

a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

b. Annualized basis uses the project assumed maximum permitted operating basis.

c. Includes worse case of high boost mode, low mode, and a startup/shutdown per day.

d. Includes the mirror washing machines (MWMs), (light duty trucks) LDTs, and Water Trucks.

e. Estimated gross MWh.

f. Value includes on-site maintenance vehicles.

g. Value does not include on-site maintenance vehicles.

h. Reported in previous document incorrectly at 82,325. (Ex. 2000, p. 4.1-98.)

## Solar Project Energy Payback Time

The energy pay-back time is the time required to produce an amount of energy as great as what was consumed during production, which in the context of a solar power plant includes all of the energy required during construction and operation. The beneficial

Greenhouse Gas Emissions

energy and GHG impacts of renewable energy projects can also be measured by the energy pay-back time. **Greenhouse Gas - Tables 1 and 2** provide an estimate of the onsite construction and operation emissions, employee transportation emissions, and the final segment of offsite materials and consumables transportation. However, there are additional direct transportation and indirect manufacturing GHG emissions associated with the construction and operation of the PSEGS Project, which are all considered in the determination of the energy pay-back time. Evidence shows estimates that the energy pay-back time for concentrating solar power plants such as PSEGS to be on the order of 5 months, and the project life for PSEGS is on the order of 30 years. Therefore, the project's GHG emissions reduction potential from energy displacement would be substantial. (Ex. 2000, p. 4.1-99.)

The PSEGS promotes the state's efforts to move towards a high-renewable, low-GHG electricity system and, therefore, reduces both the amount of natural gas used by electricity generation and GHG emissions. It does this in several ways. First, California's Energy Action Plan (EAP) Loading Order specifies that electrical energy demand be met first by energy efficiency and demand response, followed by employing renewable energy such as would be provided by PSEGS. Secondly, the energy produced by the PSEGS would displace energy from higher GHG-emitting coal- and natural-gas-fired generation resources, lowering the GHG emissions from the western United States, the relevant geographic area for the discussion of GHG emissions from electricity generation. Finally, the dependable capacity provided by the PSEGS would facilitate the retirement and/or divestiture of resources that cannot meet the Emissions Performance Standard (EPS) or are adversely affected by the SWRCB's policy on once-through cooling. (Ex. 2000, p. 4.1-100.)

California's RPS calls for 33 percent of California's electrical energy to be provided by qualifying renewable energy facilities by December 31, 2020. Under the law, the Energy Commission is required to certify eligible renewable energy resources that may be used by retail sellers of electricity and Publicly Owned Utilities (POUs) to satisfy their RPS procurement requirements, develop an accounting system to verify retail sellers' and POU's compliance with the RPS, and adopt regulations specifying procedures for enforcement of the RPS for the POUs. (Ex. 2000, p. 4.1-101.)

As California moves towards an increased reliance on renewable electrical energy by implementing the RPS, non-renewable electric energy resources will be displaced. A 33 percent RPS is forecasted to require California load-serving entities to procure more than 82,800 GWh of renewable electrical energy in 2024, an increase of roughly 28,300 GWh over current levels. As of January 2013, California is estimated to have procured 54,400 GWh. (Ex. 2000, p. 4.1-101.)

Given an RPS, renewable electrical energy displaces electricity that would otherwise be produced from coal- and natural gas-fired generation. The construction and operation of the PSEGS would not displace other renewable resources as load-serving entities must meet the renewable energy purchase requirements embodied in the RPS. Even in the absence of an RPS, PSEGS would not replace other renewables. The fuel and other variable costs associated with most forms of renewable generation are much lower than for other resources and even where this may not be the case (e.g., selected biofuels), the renewable resource will frequently have a “must-take” contract with a load-serving entity requiring that all of electrical energy produced by the project be purchased by the buyer. Hydroelectric generation is not displaced as it has very low variable costs of production; the variable cost of nuclear generation is much lower than for fossil resources as well. (Ex. 2000, pp. 4.1-101- 4.1-102.)

While the PSEGS would combust some natural gas and, thus, emit GHGs as part of its operations, it would produce far less GHG emissions (emitting approximately 132 lbs. CO<sub>2</sub>/MWh) than the coal- and natural-gas-fired resources it would displace. Coal-fired generation requires the combustion of 9,000 – 10,000 Btu/MWh, resulting in more than 1,800 lbs. CO<sub>2</sub>/MWh. Natural-gas-fired generation in California requires an average of 8,566 Btu/MWh, yielding approximately 1,000 lbs. CO<sub>2</sub>/MWh. (Ex. 2000, p. 4.1-102.)

### **The Role of the PSEGS in Capacity Displacement**

The PSEGS would provide up to 500 MW of electrical capacity and associated electrical energy to the grid during early afternoon hours in the summer. Electricity demand in California reaches its peak during mid- to late-afternoon on the hottest weekdays of the summer. Dependable capacity (the amount of capacity that can be counted upon to be available during the peak) is needed to reliably serve loads. The generation fleet, in conjunction with demand response programs, must provide a sufficient amount of dependable capacity to meet demand on the highest load day of the year, which is usually the hottest weekday in the summer, when residential and commercial cooling loads are at their highest. Load-serving entities in the California Independent System Operator (California ISO) control area, for example, are required by the California ISO to procure dependable capacity in amounts determined by their peak load forecast. (Ex. 2000, p. 4.1-102.)

While the PSEGS dependable capacity value would depend upon its exact performance, its ability to sustain output even when solar irradiance is reduced due to cloud cover and, thus, provide energy during extreme peak hours, would mean a higher value than would otherwise be the case. Although the dependable capacity can be augmented by the natural-gas-fired auxiliary boiler, if operating-period fuel use exceeds a “de minimus” level defined in the RPS regulations, the facility would no longer qualify as a renewable facility for purposes of the RPS. The dependable capacity provided by

the PSEGS would assist in replacing that lost due to the EPS and the State Water Resources Control Board’s (SWRCB) once-through cooling policy. (Ex. 2000, p. 4.1-102.)

### Replacement of High GHG-Emitting Generation

High GHG-emitting resources such as coal are effectively prohibited from entering into new long-term contracts for California electricity deliveries as a result of the EPS adopted in 2007 pursuant to SB 1368. Between now and 2020, 1,549 MW of coal-fired generation capacity under contract will have to reduce GHG emissions or be replaced. These contracts are presented in **Greenhouse Gas - Table 3**. (Ex. 2000, p. 4.1-103.)

**Greenhouse Gas - Table 3**  
**Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020**

Utility	Facility	Contract Expiration	MW
Department of Water Resources	Reid Gardner	2013 <sup>1</sup>	213
SDG&E	Boardman	2013	84
SCE <sup>2</sup>	Four Corners	2016	720
Turlock Irrigation District	Boardman	2018	55
LADWP	Navajo	2019	477
<b>TOTAL</b>			<b>1,549</b>

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.

Notes:

1. Contract not subject to Emission Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.
2. The sale of SCE’s share of Four Corners to Arizona Public Service has been approved by the CPUC and is awaiting FERC approval. (Ex. 2000, p. 4.1-103.)

### Retirement of Generation Using Once-Through Cooling

The SWRCB’s policy on cooling water intake at coastal power plants has led to the retirement and replacement of several plants that used OTC. Numerous others are likely to retire on or prior to assigned compliance dates, some of which will require replacement. The units with compliance dates on or before the end of 2020 are presented in **Greenhouse Gas - Table 4**. (Ex. 2000, p. 4.1-103.)

**Greenhouse Gas - Table 4**  
**OTC Units with SWRCB Compliance Dates on or before December 31, 2020<sup>2</sup>**

<b>Plant Name &amp; Unit</b>	<b>Local Reliability Area</b>	<b>Capacity (MW)</b>
Alamitos 1 – 6	LA Basin	2,010
El Segundo 3 & 4	LA Basin	670
Encina 1 – 5	San Diego	950
Huntington Beach 1 & 2	LA Basin	430
Mandalay 1 & 2	Ventura	436
Morro Bay 3 & 4	None	650
Moss Landing 6 & 7	None	1,510
Moss Landing 1 & 2	None	1,020
Ormond Beach 1 & 2	Ventura	1,516
Pittsburg 5 & 7 <sup>2</sup>	SF Bay	1,311
Redondo Beach 5 – 8	LA Basin	1,356
<b>Total</b>		<b>11,859</b>

Notes:

Pittsburg Unit 7 (682 MW) does not use once-through cooling but would be required to shut down if Units 5 and 6 retire. (Ex. 2000, p. 4.1-104.)

### **Facility Closure Impacts and Mitigation**

Eventually PSEGS would close either at the end of its useful life, or due to some unexpected situation such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and, thus, impacts associated with GHG emissions would no longer occur. The only other expected, albeit temporary, GHG emissions would be equipment exhaust (off-road and on-road) from dismantling activities. These activities would be of a much shorter duration than construction of the PSEGS project. Equipment used to dismantle the facility is likely to have lower comparative GHG emissions due to technology advancement during the intervening years, and this equipment would be required to be controlled in a manner at least equivalent to that required during construction. We can assume that the beneficial GHG impacts of this facility, displacement of fossil-fuel-fired generation, would be replaced by the construction of newer more efficiency-renewable energy or other low GHG-generating technology facilities. Also, the recycling of the facility components (steel, concrete, etc.) could indirectly reduce GHG emissions from decommissioning activities. Therefore, while there would be temporary adverse GHG CEQA impacts during decommissioning, we find them to be less than significant. (Ex. 2000, p. 4.1-105.)

<sup>2</sup> Greenhouse Gas - Table 4 does not include OTC units that retired prior to January 1, 2012 resources with compliance dates through 2020 that have already been slated for replacement (e.g., LADWP units at Haynes and Scattergood), or units with post-2020 compliance dates (the remaining units at Haynes and Scattergood, LADWP's Harbor combined cycle, and the nuclear facilities at San Onofre [which Southern California Edison announced on June 7, 2013, that they would close it rather than repair it] and Diablo Canyon).

## **Cumulative Impacts**

Cumulative impacts are defined as “two or more individual effects which, when considered together, are considerable or...compound or increase other environmental impacts.” (CEQA Guidelines § 15355.) “A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts.” (CEQA Guidelines § 15130[a][1].) Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects. (Ex. 2000, p. 4.1-105.)

This entire assessment is a cumulative impact assessment. The PSEGS project alone is not sufficient to change global climate, but would emit GHGs and, therefore, has been analyzed as a potential cumulative impact in the context of existing GHG regulatory requirements and GHG energy policies. (Ex. 2000, p. 4.1-105.)

## **CONCLUSIONS**

The PSEGS would emit considerably less GHGs than existing power plants and most other generation technologies and, thus, would contribute to continued improvement of the overall western United States, and specifically California, electricity system GHG emission rate average. The PSEGS project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, even though PSEGS would emit more GHGs than the approved PSPP, the evidence shows that the PSEGS operation would result in a cumulative overall reduction in GHG emissions from the state’s power plants and that any short-term impacts would be less than significant. (Ex. 2000, pp. 4.1-105 - 4.1-106.)

We conclude that GHG emissions from construction and decommissioning activities would not create significant impacts under CEQA for several reasons. First, the periods of construction and decommissioning would be short term and not ongoing during the life of the proposed project. Second, the best practices control measures, such as limiting idling times and requiring, as appropriate, equipment that meets the latest emissions standards, would further minimize GHG emissions since the use of newer equipment would increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. Finally, the construction and decommissioning emissions are miniscule when compared to the reduction in fossil-fuel power plant GHG emissions during project operation. For all these reasons, we find that the short-term emission of greenhouse gases during construction would be sufficiently reduced and would be offset during the project’s

operating period and would, therefore, not create a significant impact under CEQA. (Ex. 2000, p. 4.1-106.)

The PSEGS, as a renewable energy generation facility, will comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368 (title 20, Greenhouse Gases Emission Performance Standard, section 2900 et seq.). The project is not subject to the requirements of SB 1368 (Greenhouse Gases Emission Performance Standard, Cal. Code Regs., tit. 20, § 2900 et seq.) and the Emission Performance Standard, however, it would nevertheless meet the Emission Performance Standard. The project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (Ex. 2000, p. 4.1-106.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS**

The PSEGS, as a solar energy generation project, is exempt from the mandatory GHG emission reporting requirements for electricity generating facilities as currently required by the ARB for compliance with the California Global Warming Solutions Act of 2006 (Health and Safety Code, sections 38500 et seq.). (Ex. 2000, p. 4.1-105.)

The PSEGS, as a renewable energy generation facility, is determined by rule to comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368. (Chapter 11, Greenhouse Gases Emission Performance Standard, article 1, section 2903 [b][1].) (Ex. 2000, p. 4.1-105.)

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

GHG related noteworthy public benefits include the construction of renewable and low-GHG emitting generation technologies and the potential for successful integration into the California and greater WECC electricity systems. Additionally, the PSEGS project would contribute to meeting the State's AB 32 goals.

## **PUBLIC COMMENT**

The following comments received from the public regarding Greenhouse Gas Emissions.

**South Coast Air Quality Management District** submitted a letter signed by Andrew Lee and John Yee on November 22, 2013, making miscellaneous technical and quantitative comments and suggested revisions to tables re criteria pollutants and CO<sub>2</sub>.

On November 25, 2013, Paul Smith submitted a letter from **Tourism Economics Commission** stating that while the FSA described the loss of carbon sequestration due to loss of plant life, the FSA did not address loss of carbon sequestration from large scale, permanent soil disturbance. In addition, comments were made about the effect of dust emissions on desert ecosystems.

These concerns are all addressed above, in the **GREENHOUSE GAS EMISSIONS** section, as well as in the **AIR QUALITY** section of this Decision.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The GHG emissions from the PSEGS project construction are likely to be 45,335 MTCO<sub>2</sub> equivalent ("MTCO<sub>2</sub>E") during the 33-month construction period.
2. The GHG emissions from the PSEGS project operations are likely to be 1,412,300 MTCO<sub>2</sub> equivalent ("MTCO<sub>2</sub>E") during the 33-month construction period.
3. The impact of GHG emissions caused by this solar facility is characterized by considering how the power plant would affect the overall electricity system.
4. PSEGS operation will reduce overall GHG emissions from the electricity system.
5. There is no numerical threshold of significance under CEQA for construction-related GHG emissions.
6. PSEGS will use best practices to control its construction-related GHG emissions.
7. The PSEGS project's GHG emissions reduction potential from energy displacement is substantial.

8. PSEGS promotes the State's efforts to move towards a high-renewable, low-electricity system and, therefore, reduces both the amount of natural gas used by electricity generation and GHG emissions.
9. PSEGS construction-related GHG emissions are less than significant if they are controlled with best practices.
10. PSEGS would emit considerably less GHGs than existing power plants and most other generation technologies and, thus, would contribute to continued improvement of the overall western United States' electricity system GHG emission rate average.
11. Even though PSEGS would emit more GHGs than the approved PSPP, the evidence shows that the PSEGS operation would still result in a cumulative overall reduction in GHG emissions from the State's power plants and that any short-term impacts would be less than significant.
12. GHG emissions from construction, operations, and decommissioning activities would not create significant impacts under CEQA.
13. PSEGS, as a renewable energy generation facility, will comply with the Greenhouse Gas Emission Performance Standard requirements of SB 1368.
14. The PSEGS Project, as a cap-and-trade participant, would contribute to the goal of AB 32 to reduce statewide GHG emissions by the year 2020 to the 1990 level.
15. The California Renewable Portfolio Standard (RPS) requires the State's electric utilities to obtain at least 33 percent of the power supplies from renewable sources by December 31, 2020.
16. California's power supply loading order requires California utilities to obtain their power first from the implementation of all feasible and cost-effective energy efficiency and demand response, then from renewables and distributed generation, and finally from the most efficient available fossil-fired generation and infrastructure improvement.
17. While the PSEGS would combust some natural gas and, thus, emit GHGs as part of its operations, it would produce far less GHG emissions than the coal- and natural gas-fired resources it would displace.
18. PSEGS would not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.
19. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. PSEGS will comply with all applicable GHG emissions LORS and will produce no significant direct, indirect or cumulative environmental impacts.
2. The change in the project will not have a more beneficial effect on the public, Petitioner, and Intervenors than the PSPP.
3. There has been a substantial change in circumstances since the original approval because, at the time of the original licensing, the project was wholly-owned by Solar. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

No conditions of certification related to greenhouse gas emissions are required. The project owner would comply with mandatory ARB GHG emissions reporting regulations (California Code of Regulations, title 17, subchapter 10, article 2, sections 95100 et seq.) and/or future GHG regulations formulated by the U. S. EPA or the ARB, such as GHG emissions cap-and-trade requirements.

## **B. AIR QUALITY**

### **DESCRIPTION OF MODIFICATIONS**

The Palen Solar Electric Generating System (PSEGS) amendment proposes to replace the approved PSPP parabolic trough solar collection system and associated heat transfer fluid with solar tower technology. The PSEGS is comprised of two adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW. Petitioner (PSH) seeks to develop the PSEGS in two operational units, each consisting of one solar field, one tower, and a power block capable of producing approximately 250 MW of electricity. The solar tower technology creates steam to run an electricity generator by using a field of heliostats (elevated mirrors, each approximately 12 feet tall, mounted on pylons and guided by a sun-tracking system) to focus the sun's rays on a solar receiver steam generator (SRSG) atop a 750-foot solar tower located near the center of each solar field. The PSEGS site would use the same primary access road as the PSPP. The PSEGS project would interconnect to the regional electrical transmission grid at Southern California Edison's (SCE) Red Bluff Substation as certified for PSPP; the Red Bluff Substation is currently under construction. (Ex. 2000, p. 4.1-7.)

The PSEGS requires two natural-gas-fired boilers for each power block for a total of four for the project. One auxiliary boiler would be used during the morning startup cycle to assist the power generation equipment in coming up to operating temperature more quickly and for augmenting the solar operation when solar energy diminishes or during transient cloudy conditions. Each solar field includes one small night preservation boiler (also fueled with natural gas) to provide steam to the gland systems of the steam turbine and boiler feedwater pump turbine to prevent air ingress overnight and when steam is not available from the SRSG during shutdown periods. This boiler would also provide pegging steam to the generator during these shutdowns. (Ex. 2000, p. 4.1-7 – 4.1-8.)

The two units would share common facilities, including an on-site switchyard, a single-circuit, 230-kV generation tie-line, and a common area containing an administration building, warehouse, evaporation ponds, maintenance complex, and a meter/valve station for incoming natural gas service to the site. Other on-site facilities would include access and maintenance roads, perimeter fencing, tortoise fencing, and other ancillary security facilities. (Ex. 2000, p. 4.1-8.)

The PSEGS footprint is smaller by 572 acres than the original footprint of the PSPP. While the PSPP included the use of a private parcel (of approximately 40 acres) located in the northeast portion of the site, the PSEGS does not include any solar facility development within this private parcel. The PSPP also had Energy Commission

approval to develop the private parcels (approximately 240 acres) located in the southeastern portion of the site, if the project owner acquired the parcels. The PSEGS owner would not acquire or develop these private parcels. (Ex. 2000, p. 4.1-8.)

The primary modifications to the PSPP are as follows:

- Two 250-MW power-generating units, each consisting of a dedicated field of approximately 85,000 heliostats, a 750-foot solar tower and receiver, and a power block;
- An approximately 15-acre common facilities area located in the southwestern corner of the site, with an administrative/warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the PSPP);
- An approximately 203-acre temporary construction laydown area located in the southwestern portion of the site immediately north of the common facilities area;
- Re-routing of the generation tie-line near the western end of the route and around the under-construction Red Bluff Substation to align the PSEGS generation tie-line route immediately adjacent to the NextEra Desert Sunlight generation tie-line to minimize crossings over Interstate 10 and to ensure easy entry into the Red Bluff Substation nearest the PSEGS breaker position;
- Re-routing of the redundant telecommunication line along the generation tie-line route;
- Natural gas delivery from a new extension of the existing Southern California Gas (SoCal Gas) distribution system to the project boundary rather than using propane as proposed for PSPP;
- Reduction of the project footprint from 4,366 acres to 3,794 acres;
- Reduction of the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface;
- Reduction of the amount of water used by 99 acre-feet per year (AFY); and
- An increase in annual NOx emissions from the use of the auxiliary boilers. (Ex. 2000, p. 4.1-8.)

The following evidence on Air Quality was received into evidence on November 22, 2013: Exhibits 1003, 1007, 1018, 1021, 1041, 1043, 1045, 1054, 1056, 1057, 1079, 2006, 2008, 2013, 2014, 2015, 2016<sup>1</sup>, 3065, 3066, 3067, 3068, 3069, 3070, 3071, 3072,

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<sup>1</sup> We held the record open to receive Exhibit 2016 after the close of the evidentiary record (11/22/13 RT pdf 45:15-18). We take official notice of Exhibit 2016, the Final Determination of Compliance from SCAQMD.

3073, 3074, 3075, 3076, 3077, 3078, 3079, 3080, 3081, 3082, 3083, 3084, 3085, 3086, 3087, 3088, 3089, 3090, 3091. (11/22/13 RT 37:9 – 45:2; 11/25/13 RT 8:8 -9:21.)

## **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that the PSPP was in the Mojave Desert Air Basin (MDAB) under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). At the time, the Riverside County portion of the Mojave Desert Air Basin area was designated as attainment for all federal criteria pollutant standards, and nonattainment for state ozone and PM10 standards. The Decision found that the PSPP project met the VOC offset requirements and complied with applicable District Rules and Regulations with the inclusion of conditions of certification **AQ-1** through **AQ-51**. The Energy Commission determined that, if left unmitigated, the PSPP project's construction activities would likely contribute to significant CEQA adverse PM10 and ozone impacts. However, conditions of certification **AQ-SC1** to **AQ-SC5** were found to mitigate these potential impacts. The Decision concluded that the PSPP would not cause new violations of any NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, or CO ambient air quality standards, thus, these emission impacts were not significant.

The Decision observed that the PSPP project's direct and indirect, or secondary emissions contribution to existing violations of the ozone and PM10 ambient air quality standards would likely be CEQA significant if unmitigated. However, Condition of Certification **AQ-SC6** was found to mitigate the onsite maintenance vehicle emissions and **AQ-SC7** mitigated the operating fugitive dust emissions to less than significant levels over the life of the project. Also, Condition of Certification **AQ-SC9** required the project owner to provide VOC offsets to Staff for review. Further, Condition of Certification **AQ-SC10** ensured that emissions from the two auxiliary cooling towers were adequately controlled through the use of a high efficiency mist eliminators and monitoring of the recirculating water total dissolved solids content. The record contained an adequate analysis of the project's contributions to cumulative air quality impacts.

The South Coast Air Quality Management issued a Final Determination of Compliance on December 1, 2010, imposing conditions of compliance on project construction and operation to ensure compliance with District Rules and Regulations. These Rules and Regulations were incorporated into the conditions of certification. (PSPP Final Decision, CEC-800-2010-011, Air Quality, pp. 13-14.)

## **THE AMENDED PROJECT'S IMPACTS**

The analysis in evidence contains a complete description of the setting and existing conditions at the PSEGS site, including the climate and meteorology, the presence (or, in this case absence) of sensitive receptors and the existing ambient air quality, including pollution or objectionable odors as measured against federal and state

ambient air quality standards (AAQS) (see **Air Quality - Table 1**, below). (Ex. 2000, pp. 4.1-9 – 4.1-10.)

**Air Quality - Table 1**  
**Federal and State Ambient Air Quality Standards**

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O <sub>3</sub> )	8 Hour	0.075 ppm <sup>a</sup> (147 µg/m <sup>3</sup> )	0.070 ppm (137 µg/m <sup>3</sup> )
	1 Hour	—	0.09 ppm (180 µg/m <sup>3</sup> )
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m <sup>3</sup> )	9.0 ppm (10 mg/m <sup>3</sup> )
	1 Hour	35 ppm (40 mg/m <sup>3</sup> )	20 ppm (23 mg/m <sup>3</sup> )
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	0.053 ppm (100 µg/m <sup>3</sup> )	0.03 ppm (57 µg/m <sup>3</sup> )
	1 Hour	0.100 ppm <sup>b</sup>	0.18 ppm (339 µg/m <sup>3</sup> )
Sulfur Dioxide (SO <sub>2</sub> )	Annual	0.030 ppm (80 µg/m <sup>3</sup> )	—
	24 Hour	0.14 ppm (365 µg/m <sup>3</sup> )	0.04 ppm (105 µg/m <sup>3</sup> )
	3 Hour	0.5 ppm (1300 µg/m <sup>3</sup> )	—
	1 Hour	0.075 ppm (196 µg/m <sup>3</sup> ) <sup>c</sup>	0.25 ppm (655 µg/m <sup>3</sup> )
Particulate Matter (PM <sub>10</sub> )	Annual	—	20 µg/m <sup>3</sup>
	24 Hour	150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
Fine Particulate Matter (PM <sub>2.5</sub> )	Annual	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
	24 Hour	35 µg/m <sup>3</sup>	—
Sulfates (SO <sub>4</sub> )	24 Hour	—	25 µg/m <sup>3</sup>
Lead	30 Day Average	—	1.5 µg/m <sup>3</sup>
	Calendar Quarter	1.5 µg/m <sup>3</sup>	—
Hydrogen Sulfide (H <sub>2</sub> S)	1 Hour	—	0.03 ppm (42 µg/m <sup>3</sup> )
Vinyl Chloride (chloroethene)	24 Hour	—	0.01 ppm (26 µg/m <sup>3</sup> )
Visibility Reducing Particulates	8 Hour	—	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.

Notes: a - On April 30, 2012, U.S. EPA issued final area designations and classifications for the 2008 (0.075 ppm) 8-hour ozone standard.

b - On October 19, 2012, U.S. EPA published a proposed rule in the Federal Register revising ambient NO<sub>2</sub> monitoring requirements. Currently, near-roadway NO<sub>2</sub> monitors are required to be deployed by January 1, 2012; the proposal would establish a phased deployment, with deployment required between January 1, 2014, and January 1, 2017.

c - On June 2, 2010, the U.S. EPA established a new 1-hour SO<sub>2</sub> standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The existing 0.030 ppm annual and 0.14 ppm 24-hour SO<sub>2</sub> NAAQS, however, must continue to be used until one year following U.S. EPA initial designations of the new 1-hour SO<sub>2</sub> NAAQS. Source: (Ex. 2000, p. 4.1-11.)

The PSEGS project site is located in the MDAB within the SCAQMD portion of Riverside County. This area is designated as non-attainment for the State ozone and PM10 standards and attainment or unclassified for all federal criteria pollutant ambient air quality standards and the State CO, NO<sub>2</sub>, SO<sub>2</sub>, and PM2.5 standards. **Air Quality - Table 2** summarizes the project site area's attainment status for various applicable state and federal standards. (Ex. 2000, p. 4.1-10.)

**Air Quality - Table 2  
Federal and State Attainment Status  
Project Site Area within Riverside County**

Pollutant	Attainment Status <sup>1</sup>	
	Federal	State
Ozone	Attainment <sup>2</sup>	Moderate Nonattainment
CO	Attainment	Attainment
NO <sub>2</sub>	Unclassifiable /Attainment <sup>3</sup>	Attainment
SO <sub>2</sub>	Attainment	Attainment
PM10	Attainment <sup>2</sup>	Nonattainment
PM2.5	Attainment	Attainment

Notes:

1 - Attainment = Attainment or Unclassified, where Unclassified is treated the same as Attainment for regulatory purposes.

2 - Attainment status for the site area only, not the entire MDAB.

3 - On February 17, 2012, the U.S. Environmental Protection Agency designated all of the United States as "unclassifiable/attainment" for the short-term federal NO<sub>2</sub> standard, effective February 29, 2012.

Source: ARB 2013b, U.S.EPA 2013a. (Ex. 2000, p. 4.1-12.)

Ambient air quality monitoring data for ozone, PM10, PM2.5, CO, NO<sub>2</sub>, and SO<sub>2</sub>, compared to most restrictive applicable standards for the years between 2008 through 2012 at the most representative monitoring stations for each pollutant are shown in **Air Quality - Table 3**, and the 1-hour and 8-hour ozone, and 24-hour PM10 and PM2.5 data for the years 2004 through 2012 (PM10 and PM2.5) are shown in **Air Quality - Figure 1**. Ozone data are from the Blythe–445 West Murphy Street monitoring station, which is approximately 35 miles east of the project site; PM10, PM2.5, NO<sub>2</sub> and CO data are from the Palm Springs Fire Station monitoring station located approximately 75 miles west of the project site; and SO<sub>2</sub> data are from the Victorville–14306 Park Avenue monitoring station, which is located approximately 135 miles west northwest of the project site. These station locations were deemed to be the closest stations with data representative of the project site for the various averaging times. These data are from areas that are more urbanized than the project's location and are likely to exceed values at the project location. The highlighted data represents the recommended background values listed in **Air Quality - Table 4**. (Ex. 2000, p. 4.1-10.)

**Air Quality - Table 3**  
**Criteria Pollutant Summary**  
**Maximum Ambient Concentrations (ppm or µg/m<sup>3</sup>)**

Pollutant	Monitoring Station	Averaging Period	Units	2008	2009	2010	2011	2012	Limiting AAQS <sup>c</sup>
Ozone	Blythe-445 West Murphy Street	1 hour	ppm	0.074	0.072	0.072	0.073	0.084	0.09
Ozone	Blythe-445	8 hours	ppm	0.071	0.066	0.068	0.068	0.077	0.07
PM10 <sup>a,b</sup>	Palm Springs-Fire Station	24 hours	µg/m <sup>3</sup>	75	133.0	37	41	37	50
PM10 <sup>a,b</sup>	Palm	Annual	µg/m	23.2	*20.4	18.3	18.1	16.1	20
PM2.5 <sup>a</sup>	Palm	24 hours	µg/m	17.1	21.8	12.8	26.3	15.5	35
PM2.5 <sup>a</sup>	Palm	Annual	µg/m	7.2	*6.6	5.9	6.0	6.5	12
CO	Palm	1 hour	ppm	1.3	2.3	1.6	3.0	0.90	20
CO	Palm	8 hours	ppm	0.54	0.67	0.50	0.60	0.50	9.0
NO <sub>2</sub>	Palm	1 hour	ppm	0.049	0.048	0.046	0.045	0.045	0.18
NO <sub>2</sub>	Palm	Federal 1	ppm	0.045	0.039	0.039	0.039	0.039	0.10
NO <sub>2</sub>	Palm	Annual	ppm	0.009	0.008	0.009	0.008	*0.007	0.03
SO <sub>2</sub>	Victorville-14306 Park Avenue	1 hour (3yr 99 <sup>th</sup> percentile)	ppm	0.005	0.006	0.011	0.007	0.005	0.075
SO <sub>2</sub>	Victorville-	3 hour	ppm	0.006	0.006	0.006	0.005	0.005	0.5
SO <sub>2</sub>	Victorville-	24 hours	ppm	0.002	0.005	0.007	0.007	0.003	0.04
SO <sub>2</sub>	Victorville-	Annual	ppm	0.001	0.000	0.000	0.001	*0.001	0.03

Notes: <sup>a</sup> - Exceptional PM concentration events, such as those caused by wind storms are not shown where excluded by U.S.EPA; however, some exceptional events may still be included in the data presented.

<sup>b</sup> - The PM10 data source is in the Coachella Valley that is classified as a serious PM10 nonattainment area.

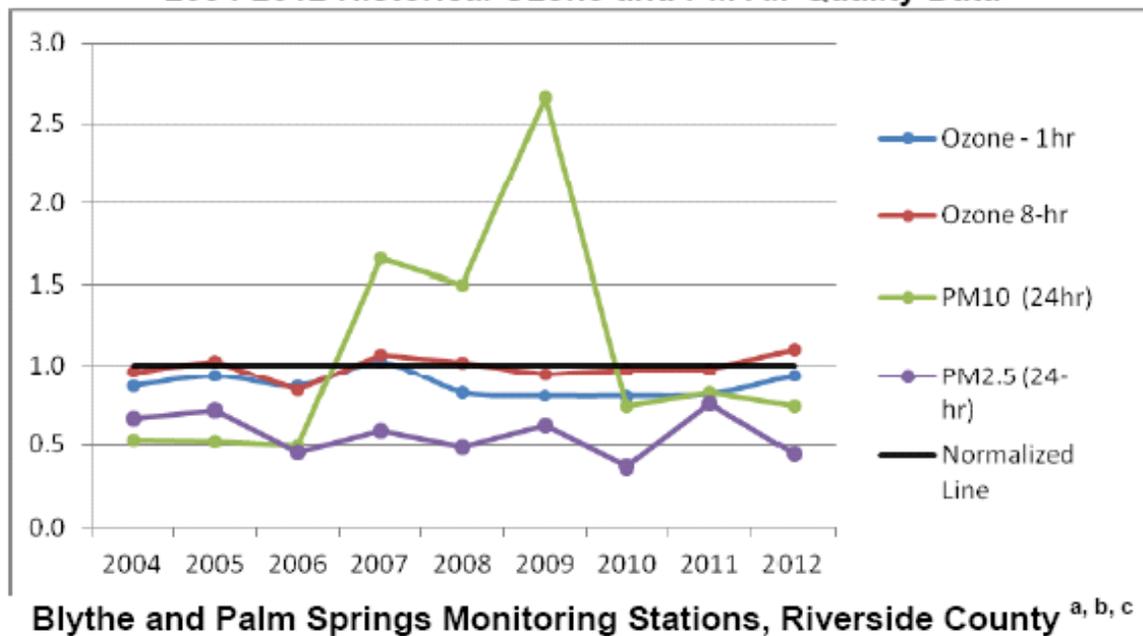
<sup>c</sup> - The limiting AAQS is the most stringent of the CAAQS or NAAQS for that pollutant and averaging period.

\* Means there was insufficient data available to determine the value.

**Bold** values were used as Staff's recommended background values in **AQ Table 5**.

Source: ARB 2013c, U.S.EPA 2013b, SCAQMD 2013. (Ex. 2000, p. 4.1-12.)

**Air Quality Figure 1**  
**2004-2012 Historical Ozone and PM Air Quality Data**



Notes: a - The highest measured ambient concentrations of various criteria air contaminants were divided by their applicable standard and provided as a graphical point. Any point on the chart that is greater than one means that the measured concentrations of such air contaminant exceed the standard, and any point that is less than one means that the respective standard is not exceeded for that year. For example the 24-hour PM10 concentration in 2008 is  $75 \mu\text{g}/\text{m}^3 / 50 \mu\text{g}/\text{m}^3$  standard = 1.5.  
 b - Ozone data are from Blythe—445 West Murphy Street monitoring station and the PM data are from the Palm Springs station.  
 c - All PM data are from Palm Springs monitoring station.  
 Source: (Ex. 2000, p. 4.1-13.)

### Ozone (O<sub>3</sub>)

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between directly emitted nitrogen oxides (NO<sub>x</sub>) and hydrocarbons (Volatile Organic Compounds [VOC]) in the presence of sunlight to form ozone. Pollutant transport from the South Coast Air Basin (Los Angeles Area) is one source of the pollution experienced in the eastern Riverside County portion of the MDAB. (Ex. 2000, p. 4.1-13.)

As **Air Quality - Table 4** and **Air Quality - Figure 1** indicate, the one-hour and eight-hour ozone concentrations measured at the eastern border of Riverside County have been very close to the standard and very slowly decreasing over time, although there is an upward trend between 2011 and 2012. The evidence indicates that the ozone violations occurred primarily during the sunny and hot periods typical during May through September. (Ex. 2000, p. 4.1-13.)

### **Nitrogen Dioxide (NO<sub>2</sub>)**

The entire air basin is classified as attainment or unclassifiable for the state and federal 1-hour NO<sub>2</sub> standard and the annual federal NO<sub>2</sub> standard. The NO<sub>2</sub> concentrations in the project area are well below the state and federal ambient air quality standards. (Ex. 2000, pp. 4.1-13 – 4.1-14.)

### **Carbon Monoxide (CO)**

The area is classified as attainment for the state and federal one-hour and eight-hour CO standards. The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. The project area, in comparison with major urban areas, only has mobile source emissions on Interstate 10, but emissions decrease rapidly with distance from the highway. Monitoring data from the Palm Springs Fire Station monitoring site data are considered to be representative of the project site and the project site CO concentrations are expected to be well below the state and federal ambient air quality standards. (Ex. 2000, p. 4.1-14.)

### **Particulate Matter (PM<sub>10</sub>) and Fine Particulate Matter (PM<sub>2.5</sub>)**

The PSEGS area is non-attainment for the State PM<sub>10</sub> standards. **Air Quality - Table 3** and **Air Quality - Figure 1** show recent PM<sub>10</sub>/PM<sub>2.5</sub> concentrations from a station in the adjacent Coachella Valley portion of the Salton Sea Air Basin (SSAB), which are assumed to provide a conservative basis for the project site area. The figure shows fluctuating concentration patterns, and shows clear exceedances of the State 24-hour PM<sub>10</sub> standard. It should be noted that exceedance does not necessarily mean violation or nonattainment, as exceptional events do occur and some of those events, which do not count as violations, may be included in the data. (Ex. 2000, p. 4.1-14.)

Fine particulate matter, or PM<sub>2.5</sub>, is derived mainly from either the combustion of materials or from precursor gases (SO<sub>x</sub>, NO<sub>x</sub>, and VOC) through complex reactions in the atmosphere. PM<sub>2.5</sub> consists mostly of sulfates, nitrates, ammonium, elemental carbon and a small portion of organic and inorganic compounds. (Ex. 2000, p. 4.1-14.)

Portions of the MDAB are classified as non attainment for the federal PM<sub>10</sub> standards and the state and federal PM<sub>2.5</sub> standards; however, the PSEGS site is located in an unclassified or attainment portion of the MDAB for these standards. This divergence in the PM<sub>10</sub> and PM<sub>2.5</sub> concentration levels and attainment status indicate that a substantial fraction of the ambient particulate matter levels are most likely due to localized fugitive dust sources such as vehicle travel on unpaved roads, agricultural operations, or wind-blown dust. Fugitive dust, unlike combustion source particulate and secondary particulate, is composed of a much higher fraction of larger particles than smaller

particles, so the PM<sub>2.5</sub> fraction of fugitive dust is much smaller than the PM<sub>10</sub> fraction. Therefore, when PM<sub>10</sub> ambient concentrations are significantly higher than PM<sub>2.5</sub> ambient concentrations this tends to indicate that a large proportion of the PM<sub>10</sub> are from fugitive dust emission sources, rather than from combustion particulate or secondary particulate emission sources. (Ex. 2000, p. 4.1-14.)

### **Sulfur Dioxide (SO<sub>2</sub>)**

Sulfur dioxide is typically emitted as a result of the combustion of fuel-containing sulfur. Sources of SO<sub>2</sub> emissions within the MDAB come from a wide variety of fuels: gaseous, liquid, and solid; however, the total SO<sub>2</sub> emissions within the eastern MDAB are limited due to the limited number of major stationary sources and California's and U.S. EPA's substantial reduction in motor vehicle fuel sulfur content. The entire air basin is classified as attainment for the state and federal SO<sub>2</sub> standards and the project area's SO<sub>2</sub> concentrations are well below the state and federal ambient air quality standards. (Ex. 2000, p. 4.1-15.)

Staff recommended the background ambient air concentrations in **Air Quality - Table 4** for use in the modeling and impacts analysis. The recommended background concentrations are based on the maximum criteria pollutant concentrations from the past three years of available data collected at the most representative monitoring stations surrounding the project site. Staff's recommended background concentration measurements come from nearby monitoring stations with similar characteristics. For the PSEGS project, the Blythe monitoring station (ozone), which is approximately 35 miles east of the project site, is the closest monitoring station. The Palm Springs monitoring station (PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>2</sub>, and CO) is located approximately 75 miles west of the project site, and the Victorville monitoring station (SO<sub>2</sub>) is located approximately 135 miles west northwest of the project site. Monitoring stations located in Imperial County were not selected or considered as representative due to the predominant air flow patterns and due to air pollution from Mexico that creates a significant local influence for the worst-case pollutant concentration readings within Imperial County. (Ex. 2000, p. 4.1-15.)

The background concentrations for PM<sub>10</sub> are well above the most restrictive existing ambient air quality standards, while the background concentrations for the other pollutants are all below the most restrictive existing ambient air quality standards. The pollutant modeling analysis was limited to the pollutants listed in **Air Quality - Table 4**. (Ex. 2000, p. 4.1-15.)

Staff reviewed the revised emission estimates and air dispersion modeling analysis provided by the Petitioner. This includes a review of the emission source inputs, including the type of source (point, volume, area) and the variables used to describe

each source (emissions, height, location, temperature, etc. as appropriate). Staff agreed that Petitioner’s emission estimates and air dispersion modeling analysis were reasonable considering the level of emissions mitigation stipulated to by the project owner. (Ex. 2000, pp. 4.1-15 – 4.1-16.)

**Air Quality - Table 4**  
**Staff Recommended Background Concentrations ( $\mu\text{g}/\text{m}^3$ )**

Pollutant	Averaging Time	Recommended Background	Limiting AAQS <sup>b</sup>	Percent of Standard
NO <sub>2</sub>	1 hour	124.3 <sup>c</sup>	339	37%
	Federal 1 hour (98 <sup>th</sup> percentile)	97.8 <sup>c</sup>	188	52%
	Annual	22.6	57	39%
CO	1 hour	3,450	23,000	15%
	8 hour	744	10,000	7%
PM <sub>10</sub>	24 hour	133	50	266%
	Annual	23.2	20	116%
PM <sub>2.5</sub>	24 hour <sup>a</sup>	26.3	35	75%
	Annual	7.2	12	60%
SO <sub>2</sub>	1 hour	28.7	196	15%
	3 hour	15.6	1,300	1%
	24 hour	18.4	105	18%
	Annual	2.9	80	4%

Source: ARB 2013c, U.S.EPA 2013b and Energy Commission Staff Analysis

Notes:

<sup>a</sup> PM<sub>2.5</sub> 24-hour data shown in **Air Quality Table 4** are 98<sup>th</sup> percentile values which is the basis of the ambient air quality standard and the basis for determination of the recommended background concentration.

<sup>b</sup> The limiting AAQS is the most stringent of the CAAQS or NAAQS for that pollutant and averaging period.

<sup>c</sup> Updated to reflect PDOC. (Ex. 2000, p. 4.1-16.)

## PROJECT EMISSIONS

### Project Construction

The total duration of project construction for PSEGS is estimated to be approximately 33 months and would include construction of the two solar fields and two power blocks. The total site-related acreage is approximately 3,794 acres, (i.e. the area inside the fence-line). Only 337.2 acres would actually be graded or have extensive earthwork. The maximum acreage disturbed on any one day during construction (earthwork phase) would be approximately 10 percent of the total, or approximately 34 acres. The maximum acreage to be disturbed during power block and heliostat installation would be 211 acres, with these disturbance activities related to vehicle movements and heliostat foundation work. The maximum acreage disturbed on any one day during power block and heliostat installation would be 26 acres. Although the site is essentially

flat, the site would require minimum grading and leveling prior to construction of the power blocks, support systems, solar array field, and site buildings. Site preparation includes finish grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations and structures is expected to begin. Once the foundations and structures are finished, installation and assembly of the mechanical and electrical equipment is scheduled to commence. (Ex. 2000, p. 4.1-17.)

Combustion emissions would result from the off-road construction equipment, including diesel construction equipment used for site grading, excavation, and construction of onsite structures, and water and soil binder spray trucks used to control construction dust emissions, and off-road construction equipment used at the onsite batch plant. Fuel combustion emissions also would result from exhaust from on-road construction vehicles including heavy duty diesel trucks used to deliver materials, other diesel trucks used during construction, and worker personal vehicles and pickup trucks used to transport workers to and from and around the construction site. Fugitive dust emissions would result from site grading/excavation activities, installation of a temporary 12 kV construction power transmission and the new project power transmission lines, completion of onsite wells and water pipelines, construction of power plant facilities, roads and substations, the use of an onsite batch plant, and vehicle travel on paved and unpaved roads. (Ex. 2000, pp. 4.1-17 – 4.1-18.)

The Petitioner's mitigated maximum daily and annual construction emission estimates for the entire PSEGS project are provided below in **Air Quality - Tables 5 and 6**. To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Worst-case daily fugitive dust emissions are expected to occur during the first months of construction when site preparation occurs. The worst-case daily combustion exhaust emissions are expected to occur during the middle of the construction schedule during the installation of the major mechanical equipment and as shown in **Air Quality - Table 5**. Annual emissions are based on the average equipment mix and use rates during the construction period. Daily emissions are derived from the annual values using the estimated construction time frame and as shown in **Air Quality - Table 6**. (Ex. 2000, p. 4.1-18.)

**Air Quality - Table 5**  
**PSEGS Construction - Maximum Daily Emissions (lbs/day)**

	NOx	VOC	CO	PM10	PM2.5	SOx
<b>Onsite Construction Emissions</b>						
Main Power Block (entire project)						
Off-road Equipment Exhaust	760.8	97.1	396	37.7	37.7	1.0
On-road Support Vehicles	0.17	0.14	1.63	0.026	0.026	0.00025
Fugitive Dust from Paved Roads	--	--	--	1.04	0.2	--
Fugitive Dust from Unpaved Roads	--	--	--	6.95	0.69	--
Fugitive Dust from Constr. Activities	--	--	--	21.7	4.65	--
Fugitive Dust from Batch Plant Emissions	--	--	--	2.09	0.21	--
<b>Subtotal - Power Block Onsite Emissions</b>	<b>761.0</b>	<b>97.2</b>	<b>397.6</b>	<b>69.5</b>	<b>43.5</b>	<b>1.0</b>
Power Block On-road Delivery/Hauling (off site)	19.9	1.55	7.62	0.93	0.93	0.04
Fugitive Dust from Access Road Construction (off site)	--	--	--	0.27	0.06	--
Worker Travel (off site)	21.9	21.0	244.9	9.32	9.32	0.45
Fugitive Dust from Paved Roads (off site)	--	--	--	7.4	1.25	--
Fugitive Dust from Unpaved Roads and track-out (off site)	--	--	--	0.29	0.05	--

Source: Palen 2013c, Table 4.1E-1 and 2

Note: Some Emissions are not additive due to occurring at different times during the construction schedule; all emissions include fugitive dust as appropriate. (Ex. 2000, p. 4.1-18.)

**Air Quality - Table 6**  
**PSEGS Construction - Maximum Annual Emissions (tons/period)**

	NOx	VOC	CO	PM10	PM2.5	SOx
<b>Construction Emissions</b>						
Main Power Block (entire project)						
Off-road Equipment Exhaust	263.6	33.64	137.2	13.07	13.07	0.36
On-road Support Vehicles	0.057	0.047	0.563	0.009	0.009	0.001
Fugitive Dust from Paved Roads	--	--	--	0.34	0.06	--
Fugitive Dust from Unpaved Roads	--	--	--	2.07	0.21	--
Fugitive Dust from Constr. Activities	--	--	--	5.02	1.08	--
Fugitive Dust from Batch Plant Emissions	--	--	--	0.31	0.03	--
<b>Subtotal - Power Block Onsite Emissions</b>	<b>263.7</b>	<b>33.7</b>	<b>137.8</b>	<b>20.8</b>	<b>14.5</b>	<b>0.36</b>
Power Block On-road Delivery/Hauling (off site)	6.9	0.54	2.64	0.323	0.323	0.013
Fugitive Dust from Access Road Construction (off site)	--	--	--	0.27	0.06	--
Worker Travel (off site)	7.59	7.28	84.9	1.4	1.4	0.155
Fugitive Dust from Paved Roads (off site)	--	--	--	7.4	1.25	--
Fugitive Dust from Unpaved Roads and track-out (off site)	--	--	--	0.29	0.05	--

Source: Palen 2013c, Table 4.1E-1 and 2

Note: Some Emissions are not additive due to occurring at different times during the construction schedule; all emissions include fugitive dust as appropriate. (Ex. 2000, p. 4.1-19.)

## **Initial Commissioning**

Initial commissioning refers to a period of approximately 40 hours total prior to beginning commercial operation when the equipment undergoes initial tuning and performance tests. This Decision contains conditions of certification that address the potential greater short-term emissions compared to normal operation emissions during this period. (Ex. 2000, p. 4.1-19.)

## **Project Operation**

The direct air pollutant emissions from power generation at the PSEGS facility are negligible; however, there are auxiliary equipment and maintenance activities necessary to operate and maintain the facility. (Ex. 2000, p. 4.1-19.)

## **Stationary Emission Sources**

PSEGS consists of the following equipment and emission estimate bases:

- One 249-MMBtu/hr auxiliary boiler, per power block, fired on natural gas. Daily emissions based on 1.7 hrs/day at 17.5 percent (low) load and 3.5 hours per day at variable high loads (25-100 percent), and a half hour for startup load each day. Annual emissions are based on 2,200 hrs/year with 1446 hours at high load (25-100 percent), with 580 hours at 17.5 percent low load, and 174 hours of startup hours. Each boiler would be equipped with low-NO<sub>x</sub> burners and selective catalytic reduction (SCR) to limit NO<sub>x</sub> emissions to 5 parts per million by volume (ppmv), and a CO catalyst to reduce CO concentrations to 25 ppmv;
- One 10.5 MMBtu/hr nighttime preservation boiler, per power block, fired on natural gas. Daily emissions based on 14 hrs/day of normal operation (annual average) at full load during the night, and 1 hour during startup based on 4,830 hrs/year at full load. Boilers will be equipped with ultra-low-NO<sub>x</sub> 9 ppmv burners and CO concentration limit of 25 ppmv;
- One 617 hp (460 kW) diesel-fired emergency fire water pump engine; Tier 3 Certification; engine emissions are based on 4.2 hours per month testing, not to exceed 50 hours per year, and will be limited to an annual maximum of 200 hrs/yr maintenance, readiness testing, and emergency use. The engine would be limited to 30 min/test in any one hour. Note the 200 hrs/yr limit is inclusive of the allotted 50 hrs/yr for maintenance and testing;
- One 3,633 hp (2500 kW) diesel-fired emergency generator engine; Tier 2 Certification; engine emissions are based on 4.2 hours per month testing, not to exceed 50 hours per year, and will be limited to an annual maximum of 200 hrs/yr emergency use. The engine would be limited to a 30 minute test in any one hour.

Note the 200 hrs/yr limit is inclusive of the allotted 50 hrs/yr for maintenance and testing;

- One wet-surface air condenser unit, circulation rate of 4,000 gallons per minute, 1500 milligrams per liter Total Dissolved Solids (TDS), drift eliminator with drift losses of less than or equal to 0.0005 percent, maximum run time of 12 hrs/day and 4,000 hrs/year;
- Additional equipment would be installed and operated, which is common to both power blocks, in the common area;
- One 617 hp (460 kW) diesel-fired emergency fire water pump engine, testing one hour test per week, not to exceed 50 hours per year. Tier 3 Certification; and
- One 398 hp (250 kW) diesel-fired emergency generator engine, testing one hour test per week, not to exceed 50 hours per year. Tier 3 Certification. (Ex. 2000, pp. 4.1-19 – 4.1-20.)

### **Mobile Emissions Sources**

Mirror washing activities will occur up to 365 days per year, approximately 20 hours per day. There will be 26 vehicles onsite dedicated to mirror washing activities. The PSEGS onsite stationary and onsite and offsite mobile source emissions, totaled for both power blocks, are estimated and summarized in **Air Quality - Tables 7 and 8**. Maximum Daily emissions are based on a 30 day average in **Air Quality - Table 7**. (Ex. 2000, p. 4.1-20.)

**Air Quality - Table 7**  
**PSEGS Operations - Maximum Daily Emissions (lbs/day)**

	NOx	VOC	CO	PM10	PM2.5	SOx
<b>Onsite Operation Emissions</b>						
Auxiliary Boilers <sup>a</sup>	42.16	11.56	96.72	14.28	14.28	5.66
Night Time Preservation Boilers	3.38	1.22	5.70	2.20	2.20	0.62
Emergency Fire Pump Engines <sup>b</sup>	1.47	0.06	0.28	0.05	0.05	0.003
Emergency Generators <sup>b</sup>	8.53	0.59	2.26	0.21	0.21	0.01
Cooling Towers	---	---	---	0.36	0.36	--
Onsite Maintenance Vehicles <sup>c</sup>	8.83	2.58	5.92	0.37	0.37	1.86
Onsite Maintenance Vehicles Fugitives <sup>c</sup>	--	--	--	118.3	18.7	--
Subtotal of Onsite Emissions	64.37	16.01	110.88	135.41	35.81	8.16
<b>Offsite Emissions<sup>d</sup></b>						
Delivery Vehicles	1.74	0.18	1.17	0.085	0.084	0.004
Employee Vehicles	3.68	3.53	41.10	0.68	0.68	0.08
Subtotal of Offsite Emissions <sup>e</sup>	5.42	3.71	42.27	0.77	0.76	0.084
Total Maximum Daily Emissions	69.79	19.72	153.15	136.2	36.6	8.24
<b>Approved PSPP Emission</b>						
<b>Approved Onsite Emissions</b>	<b>73.63</b>	<b>64.04</b>	<b>72.31</b>	<b>322.92</b>	<b>78.61</b>	<b>10.56</b>
Percent in Onsite Emissions between Proposed and Approved projects	-12%	-75%	+53%	-58%	-54%	-22%

Source: SCAQMD 2013c Facility Emissions Summaries tables and Staff estimate for employee vehicles.

a Includes both boilers worse case of high boost mode, low mode, and a startup/shutdown per day.

b Includes the common area equipment as well as both power plants.

c Includes the mirror washing machines (MWMs), (light duty trucks) LDTs, and Water Trucks.

d Appendix 4.1A Table 4.1A-11.

e SCAQMD emission estimates are different due to the on-site maintenance vehicles emissions included in Staffs subtotal of on-site emissions. (Ex. 2000, pp. 4.1-20 – 4.1-21.)

**Air Quality - Table 8**  
**PSEGS Operations - Maximum Annual Emissions (tons/yr)**

	NOx	VOC	CO	PM10	PM2.5	SOx
<b>Onsite Operation Emissions</b>						
Auxiliary Boilers <sup>a</sup>	5.65	1.36	12.57	1.73	1.73	0.68
Night Time Preservation Boilers	0.56	0.20	0.95	0.37	0.37	0.10
Emergency Fire Pump Engines <sup>b</sup>	0.27	0.01	0.05	0.0092	0.0092	0.0006
Emergency Generators <sup>b</sup>	1.53	0.11	0.41	0.04	0.04	0.0016
Cooling Towers	--	--	--	0.03	0.03	--
Onsite Maintenance Vehicles <sup>c</sup>	1.61	0.47	1.08	0.07	0.07	0.34
Onsite Maintenance Vehicles Fugitives <sup>c</sup>	--	--	--	21.6	3.42	--
Subtotal of Onsite Emissions <sup>e</sup>	<b>9.62</b>	<b>2.15</b>	<b>15.06</b>	<b>23.85</b>	<b>5.67</b>	<b>1.12</b>
<b>Offsite Emissions<sup>d</sup></b>						
Delivery Vehicles	0.23	0.18	0.15	0.08	0.08	0.004
Employee Vehicles	0.67	0.64	7.50	0.12	0.12	0.01
Subtotal of Offsite Emissions	0.9	0.82	7.65	0.2	0.2	0.014
Total Maximum Annual Emissions	10.52	2.97	22.71	47.72	11.36	1.13
<b>Approved PSPF Emission</b>						
<b>Approved Onsite Emissions</b>	<b>2.37</b>	<b>10.30</b>	<b>3.40</b>	<b>32.27</b>	<b>7.59</b>	<b>0.72</b>
Percent in Onsite Emissions between Proposed and Approved projects	+305%	-79%	+342%	+47%	+47%	-55%

Source: SCAQMD 2013c Facility Emissions Summaries tables and Staff estimate for employee vehicles.

a includes both boilers worse case of high boost mode, low mode, and a startup/shutdown per day.

b includes the common area equipment as well as both power plants.

c includes the mirror washing machines (MWMs), (light duty trucks) LDTs, and Water Trucks.

d Palen 2013ff Appendix 4.1A Table 4.1A-11

e SCAQMD emission estimates are different due to the on-site maintenance vehicles emissions included in Staffs subtotal of on-site emissions. (Ex. 2000, p. 4.1-21.)

### Air Dispersion Modeling

The Petitioner used the U.S.EPA guideline ARMS/EPA Regulatory Model (AERMOD) model as well as preprocessors to determine surface characteristics, process meteorological data, and to determine receptor elevations and hill slope factors to estimate ambient impacts from project construction and operation. Staff reviewed the background concentrations provided by the Petitioner and replaced them where appropriate with the available highest ambient background concentrations from the last three years at the most representative monitoring stations as shown in **Air Quality - Table 4**. Staff added the modeled impacts to these background concentrations and then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the PSEGS project's emission impacts would cause a new exceedance of an ambient air quality standard or would contribute to an existing exceedance. (Ex. 2000, pp. 4.1-22 – 4.1-23.)

### Construction Impacts and Mitigation

Using estimated peak hourly, daily, and annual construction equipment exhaust emissions, the Petitioner modeled the PSEGS project's construction emissions to determine

impacts. To determine the construction impacts on ambient standards (i.e. 1-hour through annual), construction was assumed to occur for 12 hours/day (8 AM to 8 PM), which represents an average of the workday periods which would fluctuate between 8 and 16 hours per day. The construction impacts modeling analysis used the same meteorological data and other modeling inputs as used for the project operating impact analysis. However, for the construction modeling, only the facility fence line and nearby downwash receptor grid (used for operational impacts) were used (both with 50-meter spacing), since maximum impacts would occur in the immediate vicinity of the property boundary due to the low plume heights during construction. (Ex. 2000, p. 4.1-23.)

The predicted PSEGS pollutant concentration levels were added to conservatively worst-case maximum background concentration levels (from **Air Quality - Table 4**) to determine the cumulative effect. The results of the Petitioner's modeling analysis are presented in **Air Quality - Table 9**. The construction emissions modeling analysis, including both the on-site fugitive dust and vehicle tailpipe emission sources (with project owner-proposed control measures) are summarized in **Air Quality - Tables 5 and 6**. (Ex. 2000, p. 4.1-24.)

**Air Quality - Table 9**  
**Maximum Project Construction Impacts**

Pollutants	Avg. Period	Project Impact (µg/m <sup>3</sup> )	Background (µg/m <sup>3</sup> )	Total Impact (µg/m <sup>3</sup> )	Standard (µg/m <sup>3</sup> )	Percent of Standard
NO <sub>2</sub>	1-hr.	200.6	124.3	324.9	339	95%
	Fed. 1 hr (98 <sup>th</sup> percentile)	168.6	97.8	266.4	188	<b>141%</b>
	Annual	0.7	22.6	23.3	57	40%
CO	1-hr	131	3,450	3581	23,000	16%
	8-hr	52	744	796	10,000	8%
PM10	24	15.3	133	148.3	50	<b>297%</b>
	Annual	0.10	23.2	23.3	20	<b>117%</b>
PM2.5	24	3.4	26.3	29.7	35	85%
	Annual	0.05	7.2	7.25	12	60%
SO <sub>2</sub>	1-hr	0.33	28.7	29.03	665	4%
	3-hr	0.21	15.6	15.81	1,300	1%
	24-hr	0.07	18.4	18.47	105	18%
	Annual	0.01	2.9	2.91	80	4%

Source: Palen 2013c

Notes: <sup>a</sup> – This is the background concentration that corresponds with the hour with the highest combined matched hourly project impact and hourly-monitored NO<sub>2</sub> background concentration.

<sup>b</sup>98<sup>th</sup> percentile NOx 1-hour OLM = 168.6 ug/m<sup>3</sup> (Ex. 2000, p. 4.1-24.)

This modeling analysis indicates, with the exception of PM10 and Federal one-hour NO<sub>2</sub>, that the PSEGS project will not create new exceedances or contribute to existing exceedances for any of the modeled air pollutants. In light of the existing PM10 non-attainment status for the project site area, the evidence indicates that the construction PM10 emissions are potentially CEQA significant, such that the off-road equipment and fugitive dust PM10 emissions must be mitigated pursuant to CEQA. We require that the off-road construction equipment be mitigated by requiring the use of equipment that meets the latest U.S. EPA and ARB engine emission standards to be certain that there would be no risk to public health from construction NOx emissions. With implementation of these mitigation measures, the construction impacts will not contribute substantially to exceedances of PM10, nor cause new exceedances of the one-hour federal NO<sub>2</sub> standard. The modeling analysis shows that, after implementation of the recommended emission mitigation measures, the PSEGS project's construction is not predicted to cause new exceedances of the AAQS. (Ex. 2000, pp. 4.1-24 – 4.1-25.)

We find that **AIR QUALITY** Conditions of Certification **AQ-SC1** through **AQ-SC5** mitigate all construction air quality impacts of the PSEGS project to less than significant levels pursuant to CEQA. Further, since the PSEGS project's direct air quality impacts have been reduced to less than significant, there is no environmental justice issue for air quality. (Ex. 2000, p. 4.1-25.)

## OPERATIONAL IMPACTS AND MITIGATION

Using estimated peak hourly, daily, and annual operating emissions, the Petitioner modeled the PSEGS project's operation emissions to determine impacts. The predicted project pollutant concentration levels were added to conservatively estimate worst-case maximum background concentration levels (**Air Quality - Table 4**) to determine the cumulative effect. **Air Quality - Table 10** presents the results of the Petitioner's modeling analysis. The operation modeling analysis includes emissions from the stationary sources for both power blocks and the on-site fugitive dust and vehicle tailpipe emission sources estimated by the Petitioner, which all include the Petitioner's proposed control measures and resulting emissions that are summarized in **Air Quality - Tables 7 and 8**. (Ex. 2000, p. 4.1-25.)

**Air Quality - Table 10**  
**Project Operation Emission Impacts**

Pollutants	Avg. Period	Project Impact ( $\mu\text{g}/\text{m}^3$ )	Background ( $\mu\text{g}/\text{m}^3$ )	Total Impact ( $\mu\text{g}/\text{m}^3$ )	Standard ( $\mu\text{g}/\text{m}^3$ )	Percent of Standard
NO <sub>2</sub>	1-hr CAAQS	177.4	124.3	301.7	339	88%
	1-hr NAAQS	5.1	97.8	102.9	188	55%
	Annual	0.20	22.6	22.8	57	40%
CO	1-hr	253.0	3,450	3,703	23,000	16%
	8-hr	12.6	744	756.6	10,000	8%
PM10	24	3.30	133	136.3	50	272%
	Annual	0.58	23.2	23.8	20	119%
PM2.5	24	0.67	26.3	27.0	35	77%
	Annual	0.11	7.2	7.3	12	61%
SO <sub>2</sub>	1-hr	1.39	28.7	30.0	665	4.5%
	3-hr	0.69	15.6	16.3	1,300	1%
	24-hr	0.15	18.4	18.5	105	17.5%
	Annual	0.008	2.9	2.9	80	2%

Source: (Ex. 2000, p. 4.1-25.)

This modeling analysis indicates that, with the exception of PM10 impacts, the PSEGS project would not create new exceedances nor contribute to existing exceedances for any of the modeled air pollutants. The conditions that would create worst-case project modeled impacts (low wind speeds) are not the same conditions when worst-case background is expected for PM10. Additionally, the worst-case PM10 impacts occur at the fence line and drop off quickly with distance from the fence line. Therefore, we find that the operation impacts, with mitigation measures would not contribute substantially to exceedances of the state PM10 AAQS. (Ex. 2000, p. 4.1-25.)

However, in light of the existing PM10 and ozone California non-attainment status for the PSEGS site area, evidence suggests that the operation NO<sub>x</sub>, VOC, and PM emissions could be potentially CEQA significant and that the off-road equipment and fugitive dust emissions should be mitigated pursuant to CEQA. The modeling analysis

shows that, after implementation of recommended emission mitigation measures, the PSEGS project's operation is not predicted to cause new exceedances of the state or federal AAQS. (Ex. 2000, p. 4.1-25.)

### **Operations Mitigation**

The record contains a detailed list of the Petitioner's recommended Best Available Control Technology (BACT) emission controls on the stationary equipment associated with the PSEGS which includes:

#### Auxiliary Boilers

The Petitioner has proposed one 249.0 mmBtu per hour auxiliary boiler per power plant unit, which would be fired only on natural gas. The auxiliary boiler would be vented to SCR, and NO<sub>x</sub> concentration would be limited to 5 ppmv; CO concentration would be limited to 25 ppmv. The criteria pollutant emission factors used for the NO<sub>x</sub> and CO emission estimates are based ≤ 5 ppmv and ≤ 25 ppmv, respectively, each at 3% O<sub>2</sub>, dry basis. Annual operation of each auxiliary boiler would be limited to 307 mmcf annual fuel usage. The maximum annual fuel usage is based on solar boosting mode (220 day/yr), non-boosting mode (120 day/yr), 10 cold starts, 5 very cold starts, and 60 boosting/emergency starts per year (see condition for definition). The boilers would have the following fuel limits, each:

Monthly fuel usage: 40 mmcf/month (AQ-19);

Commissioning fuel usage: 4.28 mmcf/month (AQ-19);

Yearly fuel usage-non commissioning year: 307 mmcf/yr (AQ-20); and

Yearly fuel usage commissioning year: 311 mmcf/yr (AQ-20).

(Ex. 2000, p. 4.1-27.)

#### Selective Catalytic Reduction (SCR)/CO Catalyst Systems

The SCR catalyst would use ammonia injection into the catalyst to reduce NO<sub>x</sub>. The subsequent chemical reaction would reduce NO<sub>x</sub> to elemental nitrogen (N<sub>2</sub>) and water, resulting in NO<sub>x</sub> concentrations in the exhaust gas no greater than 5 ppmvd at 3% O<sub>2</sub> on a 15 min average. The CO oxidation catalyst would be installed within the catalyst housing which would reduce CO in the exhaust gas to no greater than 25 ppmvd at 3% O<sub>2</sub>, on a 15 minute average. The SCR/CO catalyst systems would have the following limits:

NO<sub>x</sub>: 5 ppmv @ 3% oxygen at stack outlet;

CO: 25 ppmv @ 3% oxygen at stack outlet; and

Ammonia Slip: 5 ppmv @ 3% oxygen, 0.68 lb/hr, 894 lb/yr.

(Ex. 2000, pp. 4.1-27 – 4.1-28.)

### Night Time Preservation Boilers

The Petitioner has proposed one 10.5 mmBtu per hour nighttime preservation boiler per power plant unit, which would be fired on natural gas. Each nighttime preservation boiler would be equipped with ultra-low-NO<sub>x</sub> ppmv burners and CO concentration limit of 25 ppmv; daily emissions based on 14 hrs/day of normal operation (annual average) and annual operation of each boiler would be based on 48 mmcf annual fuel usage. Monthly operation of each boiler would be based on 4.34 mmcf fuel usage. The boilers would have the following maximum fuel limits, each:

Monthly fuel usage: 4.34 mmcf/month (AQ-39);

Commissioning fuel usage: 0.11 mmcf/month (AQ-40); and

Yearly fuel usage: 48 mmcf/yr (AQ-41). (Ex. 2000, p. 4.1-28.)

### Fire Water Pump Engines

The Petitioner has proposed one 617 bhp fire water pump engine per power plant unit, which would be fired on ARB diesel fuel with no more than 15 ppm sulfur content. The Petitioner has proposed ARB/EPA Tier 3 engines, compliant with the New Source Performance Standards, subpart III Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, for the fire water pumps. The ARB/EPA Tier 3 engines would have the following emission guarantees:

NMHC + NO<sub>x</sub>: 2.7 gram/bhp-hour;

CO: 2.6 gram/bhp-hour; and

PM<sub>10</sub>/PM<sub>2.5</sub>:0.09 gram/bhp-hour. (Ex. 2000, p. 4.1-28.)

### Large Emergency Generators

The Petitioner has proposed one 3,633 brake horsepower (bhp) emergency generator engine per power plant unit, which would be fired on ARB diesel fuel with no more than 15 ppm sulfur content. The Petitioner has proposed ARB/EPA Tier 2 engines, compliant with the New Source Performance Standards, subpart III Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, for the emergency generators. The ARB/EPA Tier 2 engines would have the following emission guarantees:

NMHC + NOx: 3.95 gram/bhp-hour;  
CO: 0.89 gram/bhp-hour; and  
PM10/PM2.5: 0.09 gram/bhp-hour. (Ex. 2000, p. 4.1-28.)

#### Small Emergency Generator

The Petitioner has proposed one 398 brake horsepower (bhp) emergency generator engine per power plant unit for the common area, which would be fired on ARB diesel fuel with no more than 15 ppm sulfur content. The Petitioner has proposed an ARB/EPA Tier 3 engine, compliant with the New Source Performance Standards, subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, for the emergency generator. The ARB/EPA Tier 3 engine would have the following emission guarantees:

NMHC + NOx: 2.79 gram/bhp-hour;  
CO: 2.31 gram/bhp-hour; and  
PM10/PM2.5: 0.11 gram/bhp-hour. (Ex. 2000, p. 4.1-28.)

#### Cooling Towers

The Petitioner has proposed one four-cell cooling tower per power plant unit, which would be used for auxiliary equipment cooling. The cooling towers would each have a high efficiency drift eliminator guaranteed to control drift to 0.0005% of the water recirculation rate. Additionally, the cooling tower recirculating water would be controlled to a maximum total dissolved solids content of 1,500 mg/l. The cooling towers would have the following emission limits, each:

PM10/PM2.5: 0.18 lb/day, 0.3 tons/year. (Ex. 2000, p. 4.1-29.)

#### Operation and Maintenance Vehicles

The project owner would use gasoline-powered light trucks equivalent to the Ford F150 model for facility maintenance, except for mirror washing, welding rigs, or other specific activities which require a larger vehicle. Only new trucks meeting California on-road vehicle emission standards would be purchased for use at the site. (Ex. 2000, p. 4.1-29.)

#### **Emission Offsets**

The District has determined NOx emissions shown in **Air Quality - Table 8** above are greater than the 4-ton-per-year exemption thresholds. Therefore, the NOx emissions are required to be offset in accordance with Rule 1303(b)(2). The Petitioner submitted a written request on 7/12/13 to opt into the NOx RECLAIM program to mitigate NOx emission, thus NOx ERC's are not required. The VOC, SOx and PM10 emissions have

a Facility Exemption from Rule 1303 (b)(2) per Rule 1304 (d)(1)(A). In addition, note that the non-RECLAIM pollutants for the emergency internal combustion engines are exempt from offsets under SCAQMD Rule 1304(a)(4). Compliance is expected. (Ex. 2000, p. 4.1-29.)

### **Adequacy of Proposed Mitigation**

Staff concurs with the District's determination that the PSEGS project's stationary source emission controls/emission levels for criteria pollutants meet all regulatory requirements. The evidence shows that the stationary source emission levels are mitigated adequately. The Petitioner will be required to provide RECLAIM trading credits prior to operation. Although the District does not require permits for the cooling tower, we impose Condition of Certification **AQ-SC10** to formalize the Petitioner's stipulated PM10 mitigation measure for this emission source. (Ex. 2000, p. 4.1-29.)

No other offsets are required as CEQA mitigation because: 1) the project is located in a federal ozone attainment area and the project's relatively low level of emissions would not impact that status; 2) the project will enable indirect emission reductions from fossil-fuel-fired power plants; and 3) the project is implementing Best Available Control Technology for the stationary emission sources, and we are requiring additional measures (**AQ-SC6**) to mitigate the operating vehicles' exhaust emissions. Additionally, we find Petitioner's fugitive dust mitigation measures provide adequate fugitive dust emission control. (Ex. 2000, p. 4.1-30.)

### **Additional Mitigation**

As mentioned above, regarding the ozone and PM10 impacts, the PSEGS project's direct stationary source ozone precursor and PM10 emissions are minimal, but when combined with the maintenance vehicles, emissions could be significant. Additionally, a solar renewable project running for 30 years in a setting likely to continue to be impacted by both local and upwind emission sources should address its contribution to the potentially ongoing nonattainment of PM10 and ozone ambient air quality standards. We find that the Petitioner and Staff's proposed mitigation measures would adequately mitigate the PSEGS project's stationary source, mobile equipment, and fugitive dust emissions. Therefore, we will formalize these operating mitigation requirements in Conditions of Certification **AQ-SC6** and **AQ-SC7**. We also impose Condition of Certification **AQ-SC8** to ensure that the Energy Commission license is amended as necessary to incorporate changes to the air quality permits. Finally, Condition of Certification **AQ-SC10** requires that the cooling towers have high efficiency mist eliminators. **AQ-SC10** also requires the project owner to test and control recirculating water total dissolved solids content to reduce particulate emissions from the cooling towers. (Ex. 2000, p. 4.1-30.) We find that the proposed emission controls and emission

levels, along with the Petitioner and Staff recommended emission mitigation measures, mitigate all PSEGS project air quality impacts to less than significant.

### **Indirect Pollutant and Secondary Pollutant Impacts**

The PSEGS project would have direct emissions of chemically-reactive pollutants (NO<sub>x</sub>, SO<sub>x</sub>, and VOC), but would also have indirect emission reductions associated with the reduction of fossil-fuel-fired power plant emissions due to the project displacing the need for their operation, since solar renewable energy facilities would operate on a “must-take” basis. However, the exact nature and location of such reductions is not known, therefore the discussion below focuses on the direct emissions from the PSEGS project within the Riverside County portion of the Mojave Desert Air Basin. (Ex. 2000, p. 4.1-31.)

#### Ozone Impacts

There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the model to determine ozone impacts. There are no regulatory agency models approved for assessing single-source ozone impacts. However, because of the known relationship of NO<sub>x</sub> and VOC emissions to ozone formation, it can be said that the emissions of NO<sub>x</sub> and VOC from the PSEGS project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These impacts would be cumulatively significant under CEQA because they would contribute to ongoing violations of the state ozone ambient air quality standards. (Ex. 2000, p. 4.1-31.)

#### PM<sub>2.5</sub> Impacts

Secondary particulate formation, which is assumed to be 100 percent PM<sub>2.5</sub>, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SO<sub>x</sub> and NO<sub>x</sub> emissions are converted into sulfuric acid and nitric acid first and then react with ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid and converts completely and irreversibly to particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase would tend to fall out; however, the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. (Ex. 2000, p. 4.1-31.)

The emissions of NO<sub>x</sub> and SO<sub>x</sub> from PSEGS do have the potential (if left unmitigated) to contribute to higher PM<sub>2.5</sub> levels in the region, however the region is in attainment for

PM2.5 standards and the low level of NOx and SOx emissions from the PSEGS project would not significantly impact that status. (Ex. 2000, p. 4.1-31.)

The Petitioner is proposing to mitigate the PSEGS project's stationary source NOx, VOC, SO<sub>2</sub>, and PM10/PM2.5 emissions through the use of Best Available Control Technology (BACT) and reduce the project's mobile source emissions by using lower emitting new vehicles. With Condition of Certification **AQ-SC5**, we find that the PSEGS project will not cause significant secondary pollutant impacts.

### **CUMULATIVE IMPACTS**

Cumulative impacts are defined by CEQA as "two or more individual effects which, when considered together, are considerable or compound or increase other environmental impacts." (CEQA Guidelines, § 15355.) A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts." (CEQA Guidelines, § 15130(a)(1).) Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely-related past, present, and reasonably foreseeable future projects. (Ex. 2000, p. 4.1-32.)

This analysis is concerned with criteria air pollutants. Such pollutants have impacts that are usually (though not always) cumulative by nature. Rarely would a project by itself cause a violation of a federal or state criteria pollutant standard. However, a new source of pollution may contribute to violations of criteria pollutant standards because of high existing background concentrations or foreseeable future projects. Air districts attempt to attain the criteria pollutant standards by adopting attainment plans, which comprise a multi-faceted programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for emissions offsets and the use of BACT for new sources of emissions, and restrictions of emissions from existing sources of air pollution. (Ex. 2000, p. 4.1-32.)

Thus, much of the preceding discussion is concerned with cumulative impacts. The analysis in evidence describes the air quality background in the Riverside County portion of the MDAB, including a discussion of historical ambient levels for each of the significant criteria pollutants. The analysis examines the PSEGS project's contribution to the local existing background caused by project construction and operation. The FSA examines SCAQMD's three recently-adopted Air Quality Management Plans, but Staff's analysis concludes that the applicable air quality plans do not outline any new control measures applicable to the PSEGS project's construction or operating emission sources. PSEGS does not conflict with SCAQMD's Air Quality Management Plans.

Therefore, Staff suggests that compliance with existing District Rules and Regulations would ensure compliance with those air quality plans. (Ex. 2000, pp. 4.1-32 – 4.1-33.)

### **Localized Cumulative Impacts**

There have been a number of new projects added to the **Project Description - Tables 2, 3 and 4** lists. While the list has not added any projects within the six-mile buffer required for cumulative modeling analysis, there are two projects within seven miles of the PSEGS. These projects are Desert Lily Soleil Project 100 MW PV plant on 1,216 acres of BLM land, and Chuckwalla Solar I, a 200 MW solar PV project on 4,083 acres. The potential for significant additional development within the air basin and corresponding increase in air basin emissions forms a major part of Staff's rationale for recommending Conditions of Certification **AQ-SC6** and **AQ-SC7**. These conditions are designed to mitigate the PSEGS project's cumulative impacts by reducing the dedicated on-site vehicle emissions and fugitive dust emissions during site operation. With these mitigation measures, we find that the PSEGS cumulative air quality impacts are not cumulatively considerable. (Ex. 2000, p. 4.1-36.)

The evidence establishes that there is no minority or low-income population within the relevant project impact area (see the **SOCIOECONOMICS** section of this Decision). Since the PSEGS project's cumulative air quality impacts have been mitigated to less than significant, there would be no environmental justice issue for air quality. (Ex. 2000, p. 4.1-36.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The SQAQMD issued a Preliminary Determination of Compliance (PDOC) for the PSEGS on October 18, 2013 (Ex. 2006), and will issue a Final Determination of Compliance (FDOC) after a public notice period. Compliance with all District Rules and Regulations was demonstrated to the District's satisfaction in the PDOC. The District's conditions are presented in the Conditions of Certification **AQ-1** to **AQ-60**. The relevant LORS are contained in the Air Quality section of **Appendix A**. (Ex. 2000, pp. 4.1-36 – 4.1-40.)

### **FEDERAL**

The District is responsible for issuing the Federal New Source Review (NSR) permit and has been delegated enforcement of the applicable New Source Performance Standards (subparts Dc, Db and IIII). The PSEGS project requires the approval of a federal agency (BLM), but the site is located in an area that is in attainment or unclassified with all federal ambient air quality standards. Therefore, the PSEGS project is not subject to general conformity regulations (40 CFR, part 93).

## **STATE**

The project owner demonstrated the PSEGS project would comply with section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury, as confirmed in the District's Determination of Compliance and the Energy Commission's affirmative finding for the project. (Ex. 2000, p. 4.1-37.)

The emergency generators and fire water pump engines are also subject to the Airborne Toxic Control Measure (ATCM) requirements for stationary compression ignition engines. This measure limits the types of fuels allowed, establishes maximum emission rates, and establishes recordkeeping requirements. The ATCM was amended October 2010, and the requirement for the Tier 4 and Tier 4i engine was removed from section 93115.6(a)(3)(A)(1)(a), table 1. Table 1 keeps the current Tier 2 and Tier 3 emissions standards for the applicable HP engine group. The ARB in November 2010 distributed a regulatory advisory that provided guidance on compliance with ATCM. This became effective on May 19, 2011, when the California Office of Administration approved the ARB rulemaking for the amendment to ATCM. The proposed emergency engines and fire water pump engines meet the current emission limit requirements of this measure. This measure would also limit the engines' readiness testing and maintenance operation to no more than 50 hours per year. (Ex. 2000, p. 4.1-37.)

## **LOCAL**

The District Rules and Regulations specify the emissions control and offset requirements for new sources such as the PSEGS. Best Available Control Technology will be implemented. Compliance with the District's new source requirements would ensure that the amended PSEGS project would be consistent with the strategies and future emissions anticipated under the District's air quality attainment and maintenance plans. (Ex. 2000, p. 4.1-37.)

The Petitioner provided an air quality permit application to the SCAQMD and the District issued a PDOC on October 18, 2013 (Ex. 2006). The PDOC states that the PSEGS project is expected to comply with all applicable District Rules and Regulations. The DOC evaluates whether, and under what conditions, the project would comply with the District's applicable rules and regulations, as described below:

## **Regulation IV – Prohibitions**

### Rule 401 – Visible Emissions

This rule limits visible emissions to opacity of less than 20 percent as published by the United States Bureau of Mines. The Petitioner would use equipment configured with BACT and would be burning natural gas in the boilers. Therefore, during normal operation, no visible emissions are expected. The emergency engines comply with BACT and would be using ultra-low-sulfur fuel; visible emissions are not expected during normal operations. The District has determined in the PDOC that the facility is expected to comply with this rule. (Ex. 2000, p. 4.1-37.)

### Rule 402 – Nuisance

This rule restricts discharge of emissions that would cause injury, detriment, annoyance, or public nuisance. Due to the application of BACT on each emission source and the distance from the emission sources to any potential receptors, the PSEGS project would comply with this rule (identical to California Health and Safety Code, section 41700). (Ex. 2000, p. 4.1-38.)

### Rule 403 – Fugitive Dust

This rule limits fugitive emissions from certain bulk storage, earthmoving, construction and demolition, and manmade conditions resulting in wind erosion. With the implementation of recommended Air Quality Conditions of Certification **AQ-SC3** and **AQ-SC4**, the facility is expected to comply with this rule. (Ex. 2000, p. 4.1-38.)

### Rule 407 – Liquid and Gaseous Air Contaminants

This rule limits CO emissions to 2,000 ppmvd and SO<sub>2</sub> emissions to 500 ppmvd, averaged over 15 minutes. For CO, for all four natural-gas-fired boilers, the applicant proposes a limit of 25 ppmvd @ 15% O<sub>2</sub>. The boilers would be conditioned as such and would be required to verify compliance testing per Rule 1146 and Rule 1303 (a). For SO<sub>2</sub>, equipment which complies with Rule 431.1 is exempt from the SO<sub>2</sub> limit in Rule 407. The Petitioner would be required to comply with Rule 431.1 and, thus, the SO<sub>2</sub> limit in Rule 407 would not apply. Per section (b)(2), the emergency engines are not subject to this rule. (Ex. 2000, p. 4.1-38.)

### Rule 409 – Combustion Contaminants

This rule limits discharge into the atmosphere from fuel-burning equipment combustion contaminants exceeding in concentration at the point of discharge, 0.1 grain per cubic foot of gas calculated to 12% of carbon dioxide (CO<sub>2</sub>) at standard conditions averaged over a minimum of 15 consecutive minutes. The PSEGS stationary sources, such as the auxiliary boiler and the night-time preservation boilers, would have particulate

concentrations below the limit of this rule. The facility is expected to comply with this rule. (Ex. 2000, p. 4.1-38.)

#### Rule 431.1 – Sulfur Content of Gaseous Fuels

Rule 431.1 limits discharge into the atmosphere of sulfur compounds from the burning of gaseous fuels. The boilers would use pipeline quality natural gas which would comply with the 16 ppm sulfur limit, calculated as H<sub>2</sub>S, specified in this rule. Natural gas would be supplied by the Southern California Gas Company. The facility proposed an H<sub>2</sub>S content of 0.75 gram/100 standard cubic foot, which is equivalent to a concentration of about 12 ppm. It is also much less than the 1 gram/100 standard cubic foot limit typical of pipeline quality natural gas. Compliance is expected. The Petitioner would comply with the reporting and record-keeping requirements as outlined in subdivision (e) of this rule. (Ex. 2000, p. 4.1-38.)

#### Rule 431.2 – Sulfur Content of Liquid Fuels

Rule 431.1 limits discharge into the atmosphere of sulfur compounds from the burning of liquid fuels. Any fuel oil combusted in the emergency engines must comply with the rule limit of 15 ppm sulfur. The emergency engines are required to use a low-sulfur fuel in the units which complies with the sulfur limits of this rule. The boilers are not using any stand-by fuel, thus, they are not subject to this rule. (Ex. 2000, p. 4.1-39.)

#### Rule 474 – Fuel Burning Equipment – Oxides of Nitrogen

This rule limits NO<sub>x</sub> emission concentrations from stationary sources, with specific concentration levels being based on heat input rates and fuel types (gas/liquid/solid). Compliance is expected with the boilers' use of ultra-low-NO<sub>x</sub> burners and the emergency generator and fire pump engines being Tier compliant engines. The boilers are not subject to sections (a) or (b). (Ex. 2000, p. 4.1-39.)

#### Rule 475-Electric Power Generating Equipment

This rule applies to power-generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meet a limit for combustion contaminants of 11 lbs/hr or 0.01 gram/standard cubic foot. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM<sub>10</sub> emissions from the boiler are estimated at 1.245 lbs/hr, and 0.0034 gram/standard cubic foot during natural-gas firing at maximum firing load. Therefore, compliance is expected. (Ex. 2000, p. 4.1-39.)

## **Regulation IX – Standards of Performance for New Stationary Sources**

### Rule 900 – Standard of Performance for New Stationary Source (NSPS)

This rule incorporates the Federal NSPS (40 CFR 60) rules by reference. The proposed boilers are subject to subpart Db and Dc. The District conditions would ensure compliance with the requirements of this rule. (Ex. 2000, p. 4.1-39.)

## **Regulation XI – Source Specific Standards**

### Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines

The purpose of Rule 1110.2 is to reduce NO<sub>x</sub>, VOC, and CO from internal combustion engines. The diesel emergency engines proposed for this project are low-usage engines which would each operate less than 200 hours per year and which would be used for firefighting and emergency electrical generation purposes only and are, therefore, exempt from the requirements of this rule per section (i)(2). Elapsed operating time meters would be installed and maintained on each engine to substantiate compliance. (Ex. 2000, p. 4.1-39.)

### Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters

The purpose of this rule is to limit NO<sub>x</sub> emissions from boilers, steam generators, and process heaters of greater than 5 MMBtu per hour rated input capacity used in industrial, institutional, and commercial operations with several listed exceptions. The rule specifies NO<sub>x</sub> limits and CO compliance plans for boilers, steam generators, and process heaters by size process function. The boilers would burn natural gas exclusively and would comply with CO BACT (applicant proposes 25 ppmv for each boiler) which is less than the 400 ppm CO limits in this rule. The Petitioner is proposing 5 ppmv NO<sub>x</sub> for the auxiliary boilers and 9 ppmv NO<sub>x</sub> for the nighttime preservation boilers the Petitioner proposes to opt-in to RECLAIM. Compliance is expected. (Ex. 2000, pp. 4.1-39 – 4.1-40.)

## **Regulation XIII – New Source Review**

### Rule 1303 – Requirements

*Rule 1303 (a) – BACT: The District requires implementation of BACT for a new emissions unit. Each of PSEGS' major units would employ current BACT for any new source which results in an emission increase of any non-attainment air contaminant, any ozone depleting compound, or ammonia. PSEGS is a new source with a potential for an increase in emissions and, therefore, BACT is required. PSEGS is expected to comply with the current minor source BACT requirements. (Ex. 2000, p. 4.1-40.)*

Rule 1303 (b)(2) – Offsets: The District analyzed NOx emissions and determined they are greater than the 4-ton-per-year exemption thresholds. Therefore, the NOx emissions are required to be offset in accordance with Rule 1303(b)(2). The Petitioner submitted a written request on July 12, 2013, to opt into the NOx RECLAIM program to mitigate NOx emissions, thus, NOx ERCs are not required. The VOC, SOx and PM10 emissions has a Facility Exemption from Rule 1303 (b)(2) per Rule 1304 (d)(1)(A). In addition, the non-RECLAIM pollutants for the emergency internal combustion engines are exempt from offsets under SCAQMD Rule 1304(a)(4). Compliance is expected. (Ex. 2000, p. 4.1-40.)

*Rule 1303 (b)(1) – Modeling: The Petitioner must substantiate with modeling that the new facility would not cause a violation, or make significantly worse, an existing violation according to Appendix A of Rule 1303, or other analysis approved by the SCAQMD Executive Officer or designee, of any state or national ambient air quality standard at any receptor location in the District. If emissions from the individual permit units are greater than the amounts in the Table A-1 of Rule 1303, then modeling is required. (Ex. 2000, p. 4.1-40.)*

Staff's review of the modeling analysis concluded that the Petitioner used the appropriate EPA approved AERMOD model along with the appropriate model options in the analysis. Therefore, compliance with modeling requirements is expected. The two auxiliary boilers comply with the limits listed in Table A-2, of Rule 1303, thus compliance with this rule is met. (Ex. 2000, p. 4.1-40.)

## **Regulation XXXI – Acid Rain Permit Program**

### Subpart A through I – Provisions

The PSEGS facility is subject to the requirements of the federal Acid Rain program. EPA reviewed 72.6(b)(4)(ii) to determine if the auxiliary boilers met the definition of cogeneration. EPA determined the boilers did not meet the definition of cogeneration and the full provision of the acid rain regulation applies. The program is similar in concept to RECLAIM in that facilities are required to cover SO<sub>2</sub> emissions with SO<sub>2</sub> allowances, analogous to NOx RTC's. PSEGS is expected to comply with this regulation. (Ex. 2000, p. 4.1-40.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is

based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

While there are no local area air quality public benefits resulting from the amended PSEGS project, it would indirectly reduce criteria pollutant emissions within the Western U.S., and part of Canada and Mexico by reducing fossil-fuel-fired electricity generation. (Ex. 2000, p. 4.1-41.)

## **PUBLIC COMMENT**

The following comments were received from the public regarding air quality:

**South Coast Air Quality Management District** submitted a letter signed by Andrew Lee and John Yee on November 22, 2013, making miscellaneous technical and quantitative comments and suggested revisions to tables re criteria pollutants and CO<sub>2</sub>.

On November 25, 2013, Paul Smith submitted a letter from **Tourism Economics Commission** stating that while the FSA described the loss of carbon sequestration due to loss of plant life, the FSA did not address loss of carbon sequestration from large scale, permanent soil disturbance. In addition, comments were made about the effect of dust emissions on desert ecosystems.

These concerns are all addressed above in the **AIR QUALITY** section, as well as in the **GREENHOUSE GAS** section of this Decision.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The PSEGS project is in the Mojave Desert Air Basin and is under the jurisdiction of the SCAQMD.
2. The Riverside County portion of the Mojave Desert Air Basin area is designated as in attainment for all federal criteria pollutant standards, and nonattainment for state ozone and PM10 standards.
3. With the exception of PM10 and Federal 1-hour NO<sub>2</sub>, the PSEGS project will not create new exceedances or contribute to existing exceedances for any of the criteria air pollutants.
4. Off-road construction equipment impacts will be mitigated by requiring the use of equipment that meets the latest U.S. EPA and ARB engine emission standards

- to be certain that there will be no risk to public health from construction NOx emissions.
5. Conditions of Certification **AQ-SC1** through **AQ-SC5** mitigate all construction air quality impacts of the PSEGS project to less than significant levels.
  6. Operation impacts, with mitigation measures, will not contribute significantly to exceedances of the state PM10 AAQS.
  7. After implementation of emission mitigation measures in the conditions of certification below, the PSEGS project's operation will not cause new exceedances of the state or federal AAQS.
  8. NOx ERCs are not required since the Petitioner has opted into the NOx RECLAIM program to mitigate NOx emission.
  9. The VOC, Sox, and PM10 emissions have a facility exemption from Rule 1303 (b)(2) per Rule 1304 (d)(1)(A).
  10. PSEGS' stationary source emission controls and emission levels for criteria pollutants meet all regulatory requirements and are mitigated adequately.
  11. Condition of Certification **AQ-SC10** formalizes the Petitioner's stipulated PM10 mitigation measure for all stationary emission sources.
  12. Mitigation measures formalized in Conditions of Certification **AQ-SC6** through **AQ-SC8** and **AQ-SC10** adequately mitigate the PSEGS project's stationary source, mobile equipment, and fugitive dust emissions.
  13. Condition of Certification **AQ-SC5** ensures that the PSEGS project will not cause significant secondary pollutant impacts.
  14. The SCAQMD's conditions of compliance on project construction and operation, which are incorporated into Conditions of Certification **AQ-1** to **AQ-60** below, ensure compliance with District Rules and Regulations.
  15. PSEGS will not produce objectionable odors affecting a substantial number of people.
  16. PSEGS does not conflict with the District's air quality plan.
  17. PSEGS cumulative air quality impacts are not cumulatively considerable.
  18. No sensitive receptors will be exposed to substantial pollutant concentrations from the PSEGS.
  19. Since the PSEGS project's cumulative air quality impacts have been mitigated below significance, there would be no environmental justice issue for air quality.

20. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. Implementation of the conditions of certification listed below ensures that the PSEGS will not result in any significant direct, indirect, or cumulative adverse impacts to air quality.
2. With implementation of the conditions of certification below, the PSEGS project will comply with all applicable LORS related to air quality as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.
3. The change in the project will be beneficial to the public, Petitioner, and Intervenor by the PSEGS site being designated “Developable” in BLM’s Eastern Riverside County Solar Energy Zone. The power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the PSPP’s parabolic trough technology. Furthermore, the PSEGS project will use less hazardous materials than the PSPP project and the solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion.
4. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process because at the time of the original licensing the project was wholly-owned by Solar Millennium, whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission’s Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

- AQ-SC1** Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4** and **AQ-SC5** for the entire project site and linear facility construction. The on-site AQCMM may delegate responsibilities to one or more AQCMM delegates. The AQCMM and AQCMM delegates shall have full access to all areas of construction on the project site and linear facilities, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be

terminated without written consent of the Compliance Project Manager (CPM).

**VERIFICATION:** At least 30 days prior to the start of ground disturbance, the project owner shall submit to the CPM for approval, the name, resume, qualifications, and contact information for the on-site AQCM and all AQCM delegates.

**AQ-SC2** Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4**, and **AQ-SC5**.

**VERIFICATION:** At least 30 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 15 days from the date of receipt.

**AQ-SC3** Construction Fugitive Dust Control: The AQCM shall submit documentation to the CPM in each Monthly Compliance Report (MCR) that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in **AQ-SC4** from leaving the project site. The definition of stabilized surface for the purposes of fugitive dust control means to control fugitive dust by means of using a soil binding agent or other effective means to suppress fugitive dust and keep it from leaving the project boundaries and not causing/creating fugitive dust plumes that would leave the project site. The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

a. The main access roads through the facility to the power block area will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved or treated prior to taking initial deliveries.

b. All unpaved construction roads and unpaved operation and maintenance site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts, including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project and linear construction sites shall be watered as frequently as necessary during grading (consistent with **BIOLOGICAL RESOURCES** Condition of Certification **BIO-8** that addresses the minimization of standing water), and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification AQ-SC4. The frequency of watering can be reduced or eliminated during periods of precipitation.

c. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

d. Visible speed limit signs shall be posted at the construction site entrances.

e. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

f. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

g. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

h. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

i. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures, as specified in the Storm Water Pollution

Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

j. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

k. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

l. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

m. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least one foot of freeboard.

n. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

**VERIFICATION:** The AQCMM shall provide the CPM a MCR to include the following to demonstrate control of fugitive dust emissions:

- A. A summary of all actions taken to maintain compliance with this condition;
- B. Copies of any complaints filed with the District in relation to project construction; and
- C. Any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

**AQ-SC4** Dust Plume Response Requirement: The AQCMM or an AQCMM delegate shall monitor all construction activities for visible dust plumes.

Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner, or (B) 200 feet beyond the centerline of the construction of linear facilities indicate that existing mitigation measures are not resulting in effective mitigation. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

**VERIFICATION:** The AQCMM shall provide the CPM a MCR to include:

- A. A summary of all actions taken to maintain compliance with this condition;
- B. Copies of any complaints filed with the District in relation to project construction; and
- C. Any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

**AQ-SC5** Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM in the MCR a table that demonstrates compliance with the AQCMP

mitigation measures for purposes of controlling diesel construction-related combustion emissions. Any deviation from the AQCMP mitigation measures requires prior CPM notification and approval.

All off-road diesel construction equipment with a rating of 50 hp or greater used in the construction of this facility shall be powered by the cleanest engines reasonably and locally available that also comply with the California Air Resources Board's (ARB) Regulation for In-Use Off-Road Diesel Fleets (California Code of Regulations, title 13, article 4.8, chapter 9, section 2449 et seq.) and shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**. The AQCMP measures shall include the following, with the lowest-emitting engine chosen in each case, as available:

- a. All off-road vehicles with compression ignition engines shall comply with the ARB's Regulation for In-Use Off-Road Diesel Fleets.
- b. To meet the highest level of emissions reduction available for the engine family of the each piece of diesel-powered equipment shall be powered by a Tier 4 engine (without add-on controls) or Tier 4i engine (without add-on controls), or a Tier 3 engine with a post-combustion retrofit device verified for use on the particular engine powering the device by the ARB or the US EPA. For PM, the retrofit device shall be a particulate filter if verified, or a flow-through filter, or at least an oxidation catalyst. For NO<sub>x</sub>, the device shall meet the latest Mark level verified to be available (as of January 2012, none meet this NO<sub>x</sub> requirement).
- c. For diesel-powered equipment where the requirements of part "b" cannot be met, the equipment shall be equipped with a Tier 3 engine without retrofit control devices or with a Tier 2 or lower Tier engine using retrofit controls verified by ARB or US EPA as the best available control device to reduce exhaust emissions of PM or nitrogen oxides (NO<sub>x</sub>) unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices can be considered "not practical" for the following, as well as other, reasons:
  1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question and the highest

level of available control using retrofit or Tier 1 engines is being used for the engine in question;

2. The use of the retrofit device would unduly restrict the vision of the operator such that the vehicle would be unsafe to operate because the device would impair the operator's vision to the front, sides, or rear of the vehicle; or
3. The construction equipment is intended to be on site for 10 work days or less.
  - a. The CPM may grant relief from a requirement in part "b" or "c" if the AQCM can demonstrate a good faith effort to comply with the requirement and that compliance is not practical.
  - b. The use of a retrofit control device may be terminated immediately provided that: (1) the CPM is informed within 10 working days following such termination; (2) a replacement for the construction equipment in question which meets the level of control required, occurs within 10 work days following such termination of the use (if the equipment would be needed to continue working at this site for more than 15 work days after the use of the retrofit control device is terminated); and (3) one of the following conditions exists:
    1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in exhaust back pressure;
    2. The retrofit control device is causing or is reasonably expected to cause engine damage;
    3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public; or
    4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.
  - a. All equipment with engines meeting the requirements above shall be properly maintained and the engines tuned to the engine manufacturer's specifications. Each engine shall be in its original configuration and the equipment or engine must be replaced if it exceeds the manufacturer's approved oil consumption rate.
  - b. Construction equipment will employ electric motors when feasible.

- c. All off-road diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCM showing that the engine meets the conditions set forth herein.

**VERIFICATION:** The AQCM shall include in the MCR the following to demonstrate control of diesel construction-related emissions:

- A. A summary of all actions taken to control diesel construction related emissions;
- B. A table listing all heavy equipment used on site during that month, showing the tier level of each engine and the basis for alternative compliance with this condition for each engine not meeting part “b” requirements. The MCR shall identify the owner of the equipment and contain a letter from each owner indicating that the equipment has been properly maintained; and
- C. Any other documentation deemed necessary by the CPM and AQCM to verify compliance with this condition.

**AQ-SC6** The project owner, when obtaining dedicated on-road or off-road vehicles for mirror washing activities and other facility maintenance activities, shall only obtain vehicles that meet California on-road vehicle emission standards or appropriate U.S.EPA/California off-road engine emission standards for the latest model year available when obtained.

**VERIFICATION:** At least 30 days prior to the start of commercial operation, the project owner shall submit to the CPM a copy of the plan that identifies the size and type of the on-site vehicle and equipment fleet and the vehicle and equipment purchase orders and contracts and or purchase schedule. The plan shall be updated every other year for any vehicles obtained since the previous report and the updated plan shall be submitted in the Annual Compliance Report.

**AQ-SC7** The project owner shall provide a site Operations Dust Control Plan, including all applicable fugitive dust control measures identified in the verification of **AQ-SC3** that would be applicable to minimizing fugitive dust emission creation from operation and maintenance activities and preventing all fugitive dust plumes that would not comply with the performance standards identified in **AQ-SC4** from leaving the project site; that:

- a. Describes the active operations and wind erosion control techniques such as windbreaks and chemical dust suppressants, including their ongoing maintenance procedures, that shall be used on areas that could be disturbed by vehicles or wind anywhere within the project boundaries; and

- b. Identifies the location of signs throughout the facility that will limit traveling on unpaved portion of roadways to solar equipment maintenance vehicles only. In addition, vehicle speed shall be limited to no more than 10 miles per hour on these unpaved roadways, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

The site operations fugitive dust control plan shall include the use of durable non-toxic soil stabilizers on all regularly used unpaved roads and disturbed off-road areas, or alternative methods for stabilizing disturbed off-road areas, within the project boundaries, and shall include the inspection and maintenance procedures that will be undertaken to ensure that the unpaved roads remain stabilized. The soil stabilizer used shall be a non-toxic soil stabilizer or soil weighting agent that can be determined to be as efficient as or more efficient for fugitive dust control than ARB approved soil stabilizers, and that shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control.

The measures and performance requirements of **AQ-SC4** shall also be included in the operations dust control plan.

**VERIFICATION:** At least 30 days prior to start of commercial operation, the project owner shall submit to the CPM for review and approval a copy of the site Operations Dust Control Plan that identifies the dust and erosion control procedures, including effectiveness and environmental data for the proposed soil stabilizer, that will be used during operation of the project and that identifies all locations of the speed limit signs. Within 60 days after commercial operation, the project owner shall provide to the CPM a report identifying the locations of all speed limit signs, and a copy of the project employee and contractor training manual that clearly identifies that project employees and contractors are required to comply with the dust and erosion control procedures and on-site speed limits.

**AQ-SC8** The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) documents for the facility.

The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project federal air permit. The project owner shall submit to the CPM any modification to any federal air permit proposed by the District or U.S. Environmental

Protection Agency (U.S. EPA), and any revised federal air permit issued by the District or U.S. EPA, for the project.

**VERIFICATION:** The project owner shall submit any ATC, PTO, and proposed federal air permit modifications to the CPM within 5 working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified ATC/PTO documents and all federal air permits to the CPM within 15 days of receipt.

**AQ-SC9** The project owner shall submit to the CPM Quarterly Operation Reports following the end of each calendar quarter that include operational and emissions information as necessary to demonstrate compliance with the conditions of certification herein. The Quarterly Operation Report will specifically note or highlight any incidences of noncompliance.

**VERIFICATION:** The project owner shall submit the Quarterly Operation Reports to the CPM and APCO no later than 30 days following the end of each calendar quarter.

**AQ-SC10** The project owner shall operate the cooling towers with high efficiency mist eliminators and shall determine and report water quality and annual emissions.

**VERIFICATION:** The project owner shall provide the following at least 30 days prior to installation of the cooling tower to the CPM for review and approval:

- A. The manufacturer specifications for the cooling tower, which provide the number of cells and design recirculating water flow rate for the two cooling towers; and
- B. The manufacturer specifications for the mist eliminators that provide a manufacturer guarantee that the mist eliminators will reduce drift to no more than 0.0005 percent of recirculating water flow.

The project owner shall provide the following in the Annual Compliance Reports:

- A. The sampling data for the recirculating water TDS concentration, performed at least quarterly, which demonstrates that the annual average TDS concentration was no more than 1,500 milligrams per liter (ppmw); and
- B. The estimated annual particulate emissions from the cooling tower using the following equation: (annual gallons of water recirculated) x (0.000005 fraction mist) x (average annual TDS concentration in mg/l) / (1,000,000) x (8.34 lbs/gallon).

### **District Conditions**

The SCAQMD has a unique system of structuring and numbering their permit conditions. In order for the reader to avoid confusion between how the SCAQMD

numbers their permit conditions and how the Staff normally numbers permit conditions, Staff prepared the following table to cross reference the conditions in the PDOC with the conditions presented by Staff in this analysis:

**AIR QUALITY - Table 12**  
**Energy Commission Conditions of Certification and SCAQMD Permit Conditions**

Energy Commission Condition of Certification	SCAQMD Permit Condition	Condition Description
<b>The following conditions of certification apply to the entire facility:</b>		
AQ-1	F9.1	Restricts discharge of visual contaminants into the atmosphere
AQ-2	F14.1	Restricts sulfur content of diesel fuel to no more than 15 ppm by weight
AQ-3	F10.1	Restricts H <sub>2</sub> S content of natural gas to no more than 0.075 grains per 100 scf
AQ-4	K67.6	Requires record keeping for architectural coating materials
AQ-5	E193.1	Requires equipment to be operated as required by Energy Commission Conditions of Certification
<b>The following conditions of certification apply to each auxiliary and nighttime preservation boiler:</b>		
AQ-6	D12.1	Requires flow meters on each boiler
AQ-7	H23.1	Requires source testing and reporting for CO
<b>The following conditions apply individually to each auxiliary boiler:</b>		
AQ-8	A63.1	Limits PM <sub>10</sub> , CO, SO <sub>x</sub> and VOC emissions during normal operations
AQ-9	A99.1	Exempts NO <sub>x</sub> emissions limit during commissioning, start-ups and trips
AQ-10	A99.2	Exempts CO emissions limit during commissioning, start-ups and trips
AQ-11	A99.3	Limits NO <sub>x</sub> emissions to 11.55 lbs/MMCF during interim period (no more than 12 months)
AQ-12	A99.4	Limits NO <sub>x</sub> emissions to 6.53 lbs/MMCF after interim period
AQ-13	A195.1	Limits CO to 25 ppmv, dry, averaged over 15 minutes

**AIR QUALITY - Table 12**  
**Energy Commission Conditions of Certification and SCAQMD Permit Conditions**

Energy Commission Condition of Certification	SCAQMD Permit Condition	Condition Description
AQ-14	A195.2	Limits NO <sub>x</sub> to 5 ppmv, dry, averaged over 15 minutes
AQ-15	A195.4	Limits NO <sub>x</sub> to 80 ppmv, 30 day rolling average during start-up, shut-down or malfunction
AQ-16	A195.6	Limits NH <sub>3</sub> to 5 ppmv at 3% O <sub>2</sub> dry, averaged over 60 minutes
AQ-17	A327.1	Limits contaminant emissions by concentration or mass, but not both at same time
AQ-18	A433.1, A433.2	Limits NO <sub>x</sub> emissions to 5 ppmv; limits start-ups to 3.5 lbs/hr per cold or very cold start; limits cold starts as follows: no more than 10.5 lbs, 10/year and duration not to exceed 180 minutes; limits very cold starts as follows: no more than 15.7 lbs, 5/year and duration not to exceed 270 minutes
AQ-19	C1.1, C1.2	Limits each boiler to no more fuel use than 40 mmcf per calendar month for normal operation and 4.28 mmcf per calendar month during commissioning
AQ-20	C1.3, C1.4	Limits each boiler to no more fuel use than 307 mmcf per year during any non-commissioning year and 311 mmcf per year during commissioning year
AQ-21	D12.3	Requires flow meter to measure hourly ammonia use
AQ-22	D12.4	Requires temperature gauge to measure temperature at SCR inlet
AQ-23	D12.5	Requires pressure gauge to measure differential pressure across SCR
AQ-24	D29.1	Requires source testing for NO <sub>x</sub> , CO, SO <sub>x</sub> , PM and NH <sub>3</sub>
AQ-25	D29.2	Requires additional source testing for NH <sub>3</sub>
AQ-26	D82.1	Requires CEMS for CO emissions

**AIR QUALITY - Table 12**  
**Energy Commission Conditions of Certification and SCAQMD Permit Conditions**

Energy Commission Condition of Certification	SCAQMD Permit Condition	Condition Description
AQ-27	D82.2	Requires CEMS for NOx emissions
AQ-28	E179.1	Defines the term “continuously recording” as hourly for ammonia and SCR temperature
AQ-29	E179.2	Defines the term “continuously recording” as once per month for SCR pressure
AQ-30	E448.1	Requires full operation of flue gas recirculation system
AQ-31	E448.4	Defines record keeping requirements
AQ-32	E448.5	Requires SCR to operate once SCR reactor inlet reaches 550 °F
AQ-33	H23.3	Defines 40 CFR 60 Subpart Db as applying to PM, SOx and NOx
AQ-34	I298.1, I298.2	Requires project owner to hold 5714 pounds of NOx reclaim credits for each boiler
AQ-35	K67.1	Requires project owner to keep monthly fuel use records for 5 years as approved by SCAQMD Executive Officer
AQ-36	K67.2	Requires project owner to keep fuel use records during certification, commissioning, and prior to CEMS certification
<b>The following conditions apply individual to each nighttime preservation boiler:</b>		
AQ-37	A63.2	Limits PM10, CO, SOx and VOC emissions during normal operations
AQ-38	A195.3	Limits NOx to 9 ppmv, dry, averaged over 15 minutes
AQ-39	C1.5	Limits each boiler to no more fuel use than 4.34 mmcf per calendar month for normal operation

**AIR QUALITY - Table 12**  
**Energy Commission Conditions of Certification and SCAQMD Permit Conditions**

Energy Commission Condition of Certification	SCAQMD Permit Condition	Condition Description
AQ-40	C1.6	Limits each boiler to no more fuel use than 0.11 mmcf in any one commissioning period
AQ-41	C1.7	Limits each boiler to no more fuel use than 48 mmcf in any one calendar year
AQ-42	D29.3	Requires source testing for NO <sub>x</sub> , CO, SO <sub>x</sub> , and PM
AQ-43	D29.4	Requires additional source test for NO <sub>x</sub> once every 5 years
AQ-44	H23.4	Defines 40 CFR 60 Subpart Dcas applying to PM and SO <sub>x</sub>
AQ-45	I298.3, I298.4	Requires project owner to hold 565 pounds of NO <sub>x</sub> reclaim credits for each boiler
AQ-46	K67.5	Requires project owner to keep fuel usage records for 5 years as approved by SCAQMD Executive Officer
<b>The following conditions apply to each diesel-fueled internal combustion engine used to power each emergency generator or fire pump:</b>		
AQ-47	B61.2	Limits diesel fuel to no more than 15 ppm by weight
AQ-48	C1.8	Limits engine operation to no more than 200 hours in any one year
AQ-49	C1.10	Limits engine operation to no more than 4.2 hours in any one month, inclusive of maintenance and testing
AQ-50	D12.2	Requires non-resettable engine time meter
AQ-51	E448.2	Requires engines to comply with 40 CFR 60.4205(B)
AQ-52	E448.3	Requires engines to be operated and maintained according to manufacturer instructions and meet 40CFR89, 94, and 1068 as applicable

**AIR QUALITY - Table 12**  
**Energy Commission Conditions of Certification and SCAQMD Permit Conditions**

Energy Commission Condition of Certification	SCAQMD Permit Condition	Condition Description
AQ-53	H23.5	Defines District Rule 1470 applicable for PM and 431.2 applicable for Sulfur
AQ-54	K67.3	Requires project owner to keep operating log records for engine
AQ-55	K67.4	Requires project owner to keep annual operating log records for 5 years
<b>The following conditions apply individually to each diesel-fueled internal combustion engine used to power an emergency generator:</b>		
AQ-56	C1.11	Limits engine operating time to no more than 30 minutes in any one day
<b>The following conditions apply individually to each 3633 BHP diesel-fueled internal combustion engine used to power an emergency generator:</b>		
AQ-57	I298.5, I298.6	Requires project owner to hold 5922 pounds of NOx reclaim credits for each engine
<b>The following conditions apply individually to each 398 BHP diesel-fueled internal combustion engine used to power an emergency generator:</b>		
AQ-58	I298.7	Requires project owner to hold 434 pounds of NOx reclaim credits for each engine
<b>The following conditions apply individually to each 617 BHP diesel-fueled internal combustion engine used to power emergency fire pumps:</b>		
AQ-59	C1.12	Limits engine operation to no more than 50 hours in any one year
AQ-60	I298.8, I298.9, I298.10	Requires project owner to hold 707 pounds of NOx reclaim credits for each engine

The following conditions of certification derive from the SCAQMD's Preliminary Determination of Compliance dated October 18, 2013. If there are changes made in the Final Determination of Compliance, the conditions below will be revised with an addendum or by other means.

*The following conditions apply to the entire project:*

**AQ-1** Except for open abrasive blasting operations, the project owner shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:

- a. as dark or darker in shade as that designated No.1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or
- b. of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subparagraph (a) of this condition.

(Rule 401, 3-2-1984; Rule 401, 11-09-2001.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-2** The project owner shall only use diesel fuel containing the following specified compounds:

COMPOUND	Range	PPM BY WEIGHT
Sulfur	Less than or equal to	15

The project owner shall maintain a copy of the MSDS on site

(Rule 431.2.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-3** The project owner shall not use natural gas containing the following specified compounds:

Compound	Grains per 100 scf
H2S	Greater than 0.750

This concentration limit is an annual average based on monthly sample of natural gas composition or gas supplier documentation. Gaseous fuel samples shall be tested using District Method 307-91 for total sulfur calculated as H2S.

(Rule 1303(b) – Offset.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-4** The project owner shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):

For architectural applications where thinners, reducers, or other VOC containing materials are added, maintain daily records for each coating consisting of (a) coating type, (b) VOC content as applied in grams per liter (g/l) of materials used for low-solids coatings, (c) VOC content as applied in g/l of coating, less water and exempt solvent, for other coatings.

For architectural applications where no thinners, reducers, or other VOC containing materials are added, maintain semi-annual records consisting of (a) coating type, (b) VOC content as applied in grams per liter (g/l) of materials used for low-solids coatings, (c) VOC content as applied in g/l of coating, less water and exempt solvent, for other coatings.

(Rule 1113.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-5** The project owner shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the final California Energy Commission decision for the 09-AFC-7 project (CEQA).

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

*The following conditions apply individually to each 249 mmBTU boiler and 10.5 mmBTU nighttime preservation boiler:*

**AQ-6** The project owner shall install and maintain a(n) flow meter to accurately indicate the fuel usage being supplied to the boiler. The project owner shall also install and maintain a device to continuously record the parameter being measured.

(Rule 1303(b)(2) – Offset, Rule 2012,40 CFR 60.48c(g)(2).)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly. As required by other conditions, the project owner shall submit all dates of operation, elapsed time in hours, and the reason for each operation in the Quarterly Operations Report (**AQ-SC9**).

**AQ-7** This equipment is subject to the applicable requirements of the following Rules or Regulations:

Contaminant	Rule	Rule/Subpart
CO	District Rule	1146

The project owner of this equipment shall comply with source testing requirements in subdivision (D)(6)--compliance determination of rule 1146. The project owner of this equipment shall comply with periodic monitoring requirements of rule 1146 (C)(8).

(Rule 1146); (40CFR 60 Subpart Dc)

**VERIFICATION:** The project owner shall submit to the CPM the report documenting results of the testing no less than 30 days after producing the report.

*The following conditions apply individually to each 249 mmBTU auxiliary boiler (facility total = 2):*

**AQ-8**

The project owner shall limit emission from this equipment as follows:

Contaminant	Emissions Limit
PM10	214 LBS IN ANY ONE MONTH
CO	1451 LBS IN ANY ONE MONTH
SOx	85 LBS IN ANY ONE MONTH
VOC	173 LBS IN ANY ONE MONTH

The project owner shall calculate the calendar monthly emissions for VOC, PM10 and SOx using the equation below and the following emission factors:

Uncontrolled emission factors: VOC: 5.7 lb/mmcf; PM10: 7.6 lb/mmcf; CO: 157.39 lb/mmcf, and SOx: 2.14 lb/mmcf.

Controlled emission factors: VOC: 4.1 lb/mmcf; PM10: 5.1 lb/mmcf; CO: 19.87 lb/mmcf and SOx: 2.14 lb/mmcf.

The uncontrolled emissions factors are to be used during start-up when the boiler is operating at 17.5% load or less

Monthly Emissions, lb/month = X (E.F.)

Where X = monthly fuel usage in mmcf/month and E.F. = emission factor indicated above.

The project owner shall calculate the emission limit(s) for the purpose of determining compliance with the monthly CO limit in the absence of valid CEMS data by using the above equation and the following emission factor(s):

- a. During the commissioning period, the 38.85 lbs CO/mmcf emissions factor to be used during low, medium and high loads. During cold start and warm start 153.30 lb/mmcf is to be used.
- b. After installation of the CO catalyst, but prior to CO CEMS certification testing – 19.87 lb CO/mmcf to be used for all modes of operation, excluding start-up operations, boiler restarts, hot restart/emergency trip, boiler cold and very cold start. 157.4 lb CO/mmcf to be used during boiler morning start-up operations,

boiler restarts, hot restart/emergency trip and boiler cold and very cold start.

- c. After CO CEMS certification testing – 19.87 lb/CO mmcf is to be used. After CO CEMS certification test is approved by the SCAQMD, the emissions monitored by the CEMS and calculated in accordance with condition 82.1 shall be used to calculate emissions.

The project owner shall provide the SCAQMD with written notification of the date of initial CO catalyst use within seven (7) days of this event.

For the purpose of this condition the boiler shall not commence normal operation until the commissioning process has been completed. The District shall be notified in writing once the commissioning process has been completed. Normal operations may proceed in the same commissioning month provided the project owner follows the requirements listed below.

The project owner shall calculate the commissioning emissions for VOC, SO<sub>x</sub> and PM<sub>10</sub> for the commissioning month (beginning of the month to the last day of commissioning) using the equation below and the following emissions factor;

VOC: 5.7 lb/mmcf;

PM<sub>10</sub> 5.25 lb/mmcf; and

SO<sub>x</sub>: 2.14 lb/mmcf.

For Start-up (cold or warm start) the following emission factors shall be used: PM<sub>10</sub>:10.5 lb/mmcf

Commissioning Emissions, lb/month = X \* EF

Where X = commissioning fuel usage in mmcf/month and E.F = emission factor indicated above.

The commissioning emissions for VOC, SO<sub>x</sub>, CO and PM<sub>10</sub> shall be subtracted from the monthly emissions limits (listed in the table at the top of this condition) and the revised monthly emissions limits will be the maximum emissions allowed for the remaining calendar month.

The project owner shall keep records of monthly emissions and the records shall be made available upon request by the SCAQMD Executive Officer.

(Rule 1303 – Offsets.)

**VERIFICATION:** The project owner shall submit all emission calculations, fuel use, CEM records and a summary demonstrating compliance of all emission limits stated in this condition for approval to the CPM on a quarterly basis in the quarterly emissions report (**AQ-SC9**).

**AQ-9** The 5.0 PPM NO<sub>x</sub> emission limits shall not apply during boiler commissioning, start-ups and emergency trips. The commissioning period shall not exceed 40 total hours. Start-up time shall not exceed the times listed below. Written records of commissioning, start-ups and emergency trips shall be maintained and made available upon request from the SCAQMD Executive Officer.

For this condition a boiler hot/emergency trip start-up is defined as a start-up in which the boiler has been shut down for less than 12 hours. A boiler hot/emergency trip start-up period shall not exceed 45 minutes. For this condition, a boiler warm start-up is defined as a start-up in which the boiler has been shut down for at least 12 hours but less than 36 hours. A boiler warm start-up period shall not exceed 90 minutes.

For this condition a boiler cold start-up is defined as a start-up in which the boiler has been shut down for at least 36 hours but less than 80 hours. A boiler cold start-up period shall not exceed 180 minutes.

For this condition boiler very cold start-up is defined as a start-up in which the boiler has been shut down for at least 80 hours. A boiler very cold start-up period shall not exceed 270 minutes.

(Rule 1703 (a)(2)-PSD BACT, Rule 2005.)

**VERIFICATION:** The project owner shall submit a commissioning phase status report monthly as needed, beginning 1 month from the time of the boiler's first fire. This commissioning status report shall demonstrate compliance with this condition. The monthly commissioning status report shall include criteria pollutant emission estimates for each commissioning activity and total commissioning emission estimates. The monthly commissioning status report shall be submitted to the CPM until the report includes the completion of all commissioning activities. The project owner shall provide the SCAQMD and the CPM with written notification of the initial start-up date no later than 60 days prior to the startup date. During operations, the project operator shall provide maximum daily emissions per minimum time period, start-up, and shutdown occurrence, and duration data as part of the Quarterly Operation Report (**AQ-SC9**), including records of all aborted startups. The project owner shall make the site available

for inspection of the commissioning and startup/shutdown records by representatives of the District, ARB, and the Commission.

**AQ-10** The 25 PPM CO emission limits shall not apply during boiler commissioning, start-ups and emergency trips. The commissioning period shall not exceed 40 total hours. Start-up time shall not exceed the times listed below. Written records of commissioning, start-ups and shall be maintained and made available upon request from the SCAQMD Executive Officer.

For this condition a boiler hot/emergency trip start-up is defined as a start-up in which the boiler has been shut down for less than 12 hours. A boiler hot/emergency trip start-up period shall not exceed 45 minutes.

For this condition, a boiler warm start-up is defined as a start-up in which the boiler has been shut down for at least 12 hours but less than 36 hours. A boiler warm start-up period shall not exceed 90 minutes.

For this condition a boiler cold start is defined as a start-up in which the boiler has been shut down for at least 36 hours but less than 80 hours. A boiler cold start-up period shall not exceed 180 minutes.

For this condition boiler very cold start is defined as a start-up in which the boiler has been shut down for at least 80 hours. A boiler very cold start-up period shall not exceed 270 minutes.

(Rule 1703 (a)(2)-PSD BACT.)

**VERIFICATION:** See **VERIFICATION** for **AQ-9**.

**AQ-11** The 11.55 LBS/MMCF NOx emission limits shall only apply during the interim reporting period during initial boiler commissioning to report RECLAIM emissions. During start-up or warm start modes the 92.40 lb/mmcf NOx emissions limits shall only apply during the interim reporting period during initial turbine commissioning to report RECLAIM emissions. The interim reporting period shall not exceed 12 months from entry into RECLAIM.

(Rule 2012 – Requirements for Monitoring, Reporting and Recordkeeping for Oxides of Nitrogen Emissions.)

**VERIFICATION:** The project owner shall submit to the CPM for approval all emissions and emission calculations required by this condition on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-SC9**.

**AQ-12** The 6.53 LBS/MMCF NOx emission limits shall only apply during the interim reporting period after initial boiler commissioning to report RECLAIM emissions. During start-up mode operations with a boiler mode not to exceed 17.5%, the 83.96 lb/mmmcf NOx emissions limits shall only apply during the interim reporting period during after initial boiler commissioning to report RECLAIM emissions The interim reporting period shall not exceed 12 months from entry into RECLAIM.

(Rule 2012 – Requirements for Monitoring, Reporting and Recordkeeping for Oxides of Nitrogen Emissions.)

**VERIFICATION:** See **VERIFICATION** for **AQ-11**.

**AQ-13** The 25 PPMV CO emission limit(s) is averaged over 15 minutes at 3 percent O2, dry.

(Rule 1703(a)(2)– PSD-BACT.)

**VERIFICATION:** None required.

**AQ-14** The 5 PPMV NOX emission limit(s) is averaged over 15 minutes at 3 percent O2, dry.

(Rule 2005, Rule 1703(a)(2)– PSD-BACT.)

**VERIFICATION:** None required.

**AQ-15** The 80 PPMV NOX emission limit(s) is averaged over 30-day rolling average.

Per §60.44(b)(h), the NOx standards under this section shall apply all times including periods of start-up, shut-down or malfunction.

§60.44(b)(i) Except as provided under paragraph (j) of this section, compliance with the emissions limits under this section is determined on a 30-day rolling average basis.

(40 CFR 60 Subpart Db.)

**VERIFICATION:** None required.

**AQ-16** The 5 ppmv NH3 emission limit is averaged over 60 minutes at 3% O2, dry basis. The project owner shall calculate and continuously record the NH3 slip concentration using the following:

NH3 (ppmv) =  $[a - b * c / 1EE+06] * 1EE+06 / b$  where:

a = NH3 injection rate (lbs/hr)/17(lb/lb-mol)

b = dry exhaust gas flow rate (scf/hr)/385.3 scf/lb-mol)

c = change in measured NOx across the SCR (ppmvd at 3% O2)

The project owner shall install and maintain a NOx analyzer to measure the SCR inlet NOx ppmv accurate to plus or minus 5 percent calibrated at least once every twelve months.

The NOx analyzer shall be installed and operated within 90 days of initial start-up.

The project owner shall use the above described method or another alternative method approved by the SCAQMD Executive Officer.

The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.

(Rule 1303(a)(1) – BACT.)

**VERIFICATION:** The project owner shall include ammonia slip concentrations averaged on an hourly basis calculated via the above protocol and provide the results as part of the Quarterly Operational Report required in Condition of Certification **AQ-SC9**. Exceedances of the ammonia limit shall be reported as prescribed herein. Chronic exceedances of the ammonia slip limit shall be identified by the project owner and confirmed by the CPM within 60 days of the fourth quarter Quarterly Operational Report (**AQ-SC9**) being submitted to the CPM. If a chronic exceedance is identified and confirmed, the project owner shall work in conjunction with the CPM to develop a reasonable compliance plan to investigate and redress the chronic exceedance of the ammonia slip limit within 60 days of the above confirmation.

**AQ-17** For the purpose of determining compliance with District Rule 475, combustion contaminants emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time. (Rule 475.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-18** The project owner shall comply at all times with the 5 ppm BACT limit for NOx, except as defined in Condition of Certification **AQ-9** and for the following scenario:

Operating Scenario	Maximum Hourly	Operational Limit
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	Emission Limit	
Start-up event	3.5 lb/hr	NOx emissions not to exceed 10.5 lbs total per cold start-up per boiler. The boiler shall be limited to 10 cold start-ups per year, with each start-up not to exceed 180 minutes.

[Rule 1703(a)(2)-PSD-BACT, Rule 2005]

Operating Scenario	Maximum Hourly Emission Limit	Operational Limit
Start-up event	3.5 lb/hr	NOx emissions not to exceed 15.7 lbs total per very cold start-up per boiler. The boiler shall be limited to 5 very cold start-ups per year, with each start-up not to exceed 270 minutes.

(Rule 1703(a)(2)-PSD-BACT, Rule 2005.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-19** The project owner shall limit the fuel usage to no more than 40 mmcf in any one calendar month. For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler during a non-commissioning year.

The project owner shall limit the fuel usage to no more than 4.28 mmcf in any one calendar month. For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler during the commissioning period.

The project owner shall record and maintain the amount of all fuel combusted during calendar month. The fuel usage records shall be kept for a period of five years and all records shall be made available to District personnel upon request. (Rule 1303(b)(2) Offset.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-20** The project owner shall limit the fuel usage to no more than 307 mmcf in any one year. For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler during a non-commissioning year.

The project owner shall limit the fuel usage to no more than 311 mmcf in any one year. For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler during a commissioning year.

The project owner shall maintain records in a manner approved by the District to demonstrate compliance with this condition. A “year” is defined as 12-month rolling average. The fuel usage records shall be kept for a period of five years and all records shall be made available to District personnel upon request.

(Rule 1401, Rule 1701 (b), Rule 1303 (b)(2).)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall report the quantity of fuel used during the 12-month rolling average reporting year, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-21** The project owner shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia. The project owner shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months. The records shall be kept on site and made available to SCAQMD personnel upon request. The maximum ammonia injection rate shall not exceed 1.9 gal/hr based on (Rule 1303(a)(1) – BACT, Rule 2005.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-22** The project owner shall install and maintain a(n) temperature gauge to accurately indicate the temperature in the exhaust at the inlet to the SCR reactor. The project owner shall also install and maintain a device to continuously record the parameter being measured. The measuring

device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months. The records shall be kept on site and made available to SCAQMD personnel upon request. The catalyst temperature range shall remain between 550 degree F and 750 degree F. The catalyst inlet temperature shall not exceed 750 degrees F. The temperature range requirement of this condition does not apply during start-up operations of the boiler listed in Condition of Certification **AQ-9**.

(Rule 1303(a)(1) – BACT, Rule 2005.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-23** The project owner shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches of water column. The project owner shall also install and maintain a device to continuously record the parameter being measured. The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every 12 months. The records shall be kept on site and made available to SCAQMD personnel upon request. The pressure drop across the catalyst and ammonia injection grid shall not exceed 4.5 inches water column. (Rule 1303(a)(1) – BACT, Rule 2005.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-24** The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be Tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District Method 100.1	15 minutes	Outlet of the SCR serving this equipment

CO emissions	District Method 100.1	15 minutes	Outlet of the SCR serving this equipment
SOx emissions	SCAQMD Laboratory Method 307-91	Not applicable	Fuel Sample
PM emissions	District method 5.1	1 hour minimum	Outlet of the SCR serving this equipment
NH3 emissions	District method 201.7 or EPA method 17	1 hour	Outlet of the SCR serving this equipment

The test shall be conducted after SCAQMD approval of the source test protocol, but no later than 180 days after initial start-up. The SCAQMD shall be notified of the date and time of the test at least 10 days prior to the test. The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (mmcf/hour), and the flue gas flow rate.

The test shall be conducted in accordance with SCAQMD approved test protocol. The protocol shall be submitted to the SCAQMD engineer no later than 45 days before the proposed test date and shall be approved by the SCAQMD before the test commences.

The test protocol shall include the proposed operating conditions of the boiler during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted for each load, while firing at maximum, minimum and low firing rates. The test shall be conducted for compliance verification of the 25 ppmv CO limit.

The test shall be conducted for compliance verification of the 5 ppmv NOx limit. The test shall be conducted for compliance verification of the 5 ppmv ammonia slip limit.

Two complete copies of source test reports (include the application number and a copy of the permit in the report) shall be submitted to the District (addressed to South Coast Air Quality Management District, Attention: Roy Olivares (or Successor), P.O. Box 4941, Diamond Bar, CA 91765). The results in writing shall be submitted within 45 days after the source test is completed. It shall include, but not be limited to, emissions rate in pounds per hour and concentration in ppmv at the outlet of the boiler.

A testing laboratory certified by the SCAQMD laboratory approval program (LAP) in the required test methods for criteria pollutant to be measured, and in compliance with district Rule 304 (no conflict of interest) shall conduct the test.

Sampling facilities shall comply with the SCAQMD “guidelines for construction of sampling and testing facilities,” pursuant to Rule 217.

Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset, Rule 2005, Reg 1703 (a-PSD-BACT)

**VERIFICATION:** The project owner shall submit to the CPM for review and the District for approval, the project owner’s proposed test protocol. The project owner shall submit evidence of the District’s approval of the test protocol within 5 days of receipt. The project owner shall submit a report documenting results of the testing no less than 30 days after producing the report.

**AQ-25** The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be Tested	Required Test Method(s)	Averaging Time	Test Location
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	60 minutes	Outlet of the SCR serving this equipment

The test shall be conducted and the results submitted to the District within 45 days after the test date. The SCAQMD shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted at least quarterly during the first 12 months of operation and at least annually thereafter. The NOx concentration, as

determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60-minute-averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 BACT concentration limit. (Rule 1303(a)(1) – BACT.)

**VERIFICATION:** The project owner shall submit a report documenting results of the testing no less than 30 days after producing the report.

**AQ-26**

The project owner shall install and maintain a CEMS to measure the following parameters: CO concentration in ppmv.

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS shall be installed and operated no later than 90 days after initial start-up of the boiler, and in accordance with an approved SCAQMD Rule 218 CEMS plan application. The project owner shall not install the CEMS prior to receiving initial approval from SCAQMD. Within two weeks of the boiler start-up, the project owner shall provide written notification to the District of the exact date of start-up. The CEMS shall be installed and operated to measure CO concentrations over a 15 minute averaging time period. The CEMS would convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr =  $K C_{co} F_d [20.9\% - \%O_2 d]$   $[(Q_g * HHV)/106]$ , where:

$$K = 7.267 * 10^{-8} \text{ (lb/scf)/ppm}$$

$C_{co}$  = Average of four consecutive 15 min. ave. CO concentration,

ppm

$$F_d = 8710 \text{ dscf/MMBTU natural gas}$$

$$\%O_2 d = \text{Hourly ave. \% by vol. } O_2 \text{ dry, corresponding to } C_{co}$$

$$Q_g = \text{Fuel gas usage during the hour, scf/hr}$$

$$HHV = \text{Gross high heating value of fuel gas, BTU/scf}$$

(Rule 1703(a)(2)– PSD-BACT, Rule 218.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-27**

The project owner shall install and maintain a CEMS to measure the following parameters: NOx concentration in ppmv.

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

The CEMS shall be installed and operating no later than 90 days after initial start-up of the boiler and shall comply with the requirements of Rule

2012. During the interim period between the initial start-up and the provisional certification date of the CEMS, the project owner shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the boiler start-up date, the project owner shall provide written notification to the District of the exact date of start-up. The CEMS shall be installed and operating (for BACT purposes only) no later than 90 days after initial start up of the boiler. (Rules 2005, 2012, and 1703.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-28** For the purpose of the following condition number(s), “continuously record” shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour: condition number **AQ-29** and condition number **AQ-30** (Rule 1303(a)(1) – BACT, Rule 2005-BACT).

**VERIFICATION:** None required.

**AQ-29** For the purpose of the following condition numbers, continuously record shall be defined as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month: Condition of Certification number **AQ-31** (Rule 1303(a)(1) – BACT, Rule 2005-BACT).

**VERIFICATION:** None required.

**AQ-30** The project owner shall comply with the following requirements:

This boiler shall not be operated unless the flue gas recirculation system is in full operation.

The project owner shall have the burner equipped with a control system to automatically regulate the combustion air, fuel, and recirculation flue gas as the boiler load varies. This control system shall be adjusted and tuned according to the manufacturer’s specifications to maintain its ability to repeat the same performance at the same firing rate. (Rule 1303 (a), Rule 2005.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer

stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly. As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-31** The project owner shall comply with the following requirements:

§60.49b reporting and record keeping requirements and shall include the following:

(a)(1) The design heat input capacity of the boilers and the type of fuels to be used by the equipment;

(a)(2) If applicable, a copy of any federally enforceable requirements that limits the annual capacity factor for any fuel or mixture of fuels under §§ 60.42b(d)(1), 60.43b(a)(2), (a)(3)(iii), (c)(2)(ii), (d)(2)(ii), 60.44b(c), (d), (e), (i),(j), (k), 60.45b(d), (g), 60.46b(h)(1), or 60.48b(i);

(a)(3) The annual capacity factor at which the project owner anticipated operating the project based on all fuels fired and based on each individual fuel fired;

§60.49b(d)(1) The owner or operator of an affected project shall record and maintain records of the amounts of each fuel combusted each day and calculate the annual capacity factor individually for coal, distillate oil, residual oil, natural gas, wood, and municipal-type solid waste for the reporting period. The annual capacity factor is determined on a 12 month rolling average basis with a new annual capacity factor calculated at the end of each calendar month;

§60.49b(g) The project owner of the boilers subject to the NO<sub>x</sub> standards under 60.44b shall maintain records of the following information for each steam generating unit operating day:

1. Calendar date;
2. The average hourly NO<sub>x</sub> emissions rate (expressed as NO<sub>2</sub>)(ng/J or lb/mmbtu heat input);
3. The 30 day average NO<sub>x</sub> emission rate calculated at the end of each steam generating unit operating day from the measured or predicted hourly nitrogen oxide emissions rate for the proceeding 30 steam generating unit operating days;

4. Identification of the steam unit operating days when the calculated 30-day average NOx emissions rates are in excess of the NOx emissions standards under 60.44b, with the reasons for such excess emissions as well as a description of corrective action taken;
5. Identifications of the steam generating unit operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective action taken;
6. Identification of the times when emissions data have been excluded from the calculations of average emission rates and the reasons for excluding data;
7. Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;
8. Identification of the times when the pollutant concentration exceeded full span of CEMs;
9. Description of any modifications to the CEMs that could affect the ability of the CEMs to comply with Performance Specification 2 or 3; and
10. Results of daily CEMs drift test and quarterly accuracy assessments as required under **Appendix F**, Procedure 1 of this part.

§60.49b (h) The owner or operator of any affected project in any category listed in paragraph (h)(1) or (2) of this section is required to submit excess emission reports for any excess emission that occurred during the reporting period.

§60.49b (i) The owner or operator of any affected project subject to the continuous monitoring requirements for NOx under §60.48b shall submit reports containing the information recorded under paragraph (g) of this section.

The project owner shall comply with remaining sections of this subpart, if applicable. (40 CFR 60, subpart Db.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly. As part of the quarterly emissions report required by Condition of

Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-32** The project owner shall comply with the following requirements:

The ammonia injection system shall be placed in full operation as soon as the minimum temperature is reached. The minimum temperature is listed as 550 degrees F. at the inlet to the SCR reactor. (Rule 1303(a)(1) – BACT, Rule 2005.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-33** This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM	40CFR60, SUBPART	Db
SOX	40CFR60, SUBPART	Db
NOx	40CFR60, SUBPART	Db

(40CFR 60 Subpart Db.)

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-34** This equipment shall not be operated unless the project holds 5714 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operations. In addition, this equipment shall not be operated unless the project owner demonstrates to the SCAQMD Executive Officer that, at commencement of each compliance year after the start of operation, the facility holds 5645 pounds RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by hold RTCs may be transferred upon their respective expiration dates. His hold amount is addition to any other

amount of RTCs required to be held under condition(s) stated in this permit. (Rule 2005.)

**VERIFICATION:** The project owner shall transmit a copy of their procurement document verification annually. As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-35** The project owner shall keep records in a manner approved by the SCAQMD Executive Officer, for the following parameter(s) or item(s):

Retain all records required by permit for a period of five years and make all records available to district personnel upon request.

The project owner shall record and maintain the amount of all fuel combusted during each calendar month. The fuel usage records shall be kept for a period of five years and all records shall be made available to district personnel upon request. (Rule 1303 (b)(2), 40 CFR 60, subpart Db.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall report monthly fuel use by each boiler, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-36** The project owner shall keep records in a manner approved by the District, for the following parameter(s) or item(s):

Natural gas fuel use after CEMS certification;

Natural gas fuel use during the commissioning period; and

Natural gas fuel use after the commissioning period and prior to CEMS certification. (Rule 2012.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall report fuel use by each boiler during each time period identified in this condition, assert that they comply with this condition, and report any instances of noncompliance.

*The following conditions apply individually to each 10.5 mmBTU nighttime preservation boiler (facility total = 2):*

**AQ-37**

The project owner shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
PM <sub>10</sub>	33 LBS IN ANY ONE MONTH
CO	86 LBS IN ANY ONE MONTH
SO <sub>x</sub>	9 LBS IN ANY ONE MONTH
VOC	18 LBS IN ANY ONE MONTH

The project owner shall calculate the calendar monthly emissions for VOC, PM<sub>10</sub> and SO<sub>x</sub> using the equation below and the following emission factors: VOC: 4.2 lb/mmcf; PM<sub>10</sub>: 7.6 lb/mmcf; CO: 19.72 lb/mmcf and SO<sub>x</sub>: 2.14 lb/mmcf.

$$\text{Monthly Emissions, lb/month} = X (\text{E.F.})$$

Where X = monthly fuel usage in mmscf/month and E.F. = emission factor indicated above.

For the purpose of this condition the boiler shall not commence with normal operation until the commissioning process has been completed. The District shall be notified in writing once the commissioning process has been completed. Normal operations may proceed in the same commissioning month provide the project owner follows the requirements listed below.

The project owner shall calculate the commissioning emissions for VOC, SO<sub>x</sub>, PM<sub>10</sub> and CO for the commissioning month (beginning of the month to the last day of commissioning) using the equation below and the following emissions factor; VOC: 5.67 lb/mmcf; PM<sub>10</sub> 13.65 lb/mmcf; SO<sub>x</sub>: 2.14 lb/mmcf and CO: 18.96 lb/mmcf.

$$\text{Commissioning Emissions, lb/month} = X * \text{EF}$$

Where X = commissioning fuel usage in mmcf/month and E.F = emission factor indicated above.

The commissioning emissions for VOC, SO<sub>x</sub>, CO and PM<sub>10</sub> shall be subtracted the monthly emissions limits (listed in the table at the top of this condition) and the revised monthly emissions limits will be the maximum emissions allowed for the remaining month. (Rule 1303 – Offsets.)

**VERIFICATION:** The project owner shall submit all emission calculations, fuel use, CEM records and a summary demonstrating compliance of all emission limits stated in this condition for approval to the CPM on a quarterly basis in the Quarterly Emissions Report (**AQ-SC9**).

**AQ-38** The 9 PPMV NOX emission limit(s) is averaged over 15 minutes at 3 percent O2, dry.  
(Rule 2005, Rule 1703(a)(2)– PSD-BACT.)

**VERIFICATION:** None required.

**AQ-39** The project owner shall limit the fuel usage to no more than 4.34 mmcf in any one calendar month.

For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler.

The project owner shall record and maintain the amount of all fuel combusted during each calendar month. The fuel usage records shall be kept for a period of five years and all records shall be made available to district personnel upon request.

(40 CFR 60, subpart Dc, rule 1303(b)(2) Offset.)

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-40** The project owner shall limit the fuel usage to no more than 0.11 mmcf in any one commissioning period.

For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler.

The project owner shall record and maintain the amount of all fuel combusted during each calendar month. The fuel usage records shall be kept for a period of five years and all records shall be made available to district personnel upon request. (40 CFR 60, subpart Dc, rule 1303(b)(2) Offset.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-41** The project owner shall limit the fuel usage to no more than 48 mmcf in any one calendar year.

For the purpose of this condition, fuel usage shall be defined as the total natural gas usage of a single boiler.

The project owner shall record and maintain the amount of all fuel combusted during each year. The fuel usage records shall be kept for a period of five years and all records shall be made available to district personnel upon request. (Rule 1401, Rule 1303 (b)(2).)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall report the quantity of fuel used during the reporting year, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-42** The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NOx emissions	District Method 100.1	15 minutes	Outlet stack
CO emissions	District Method 100.1	15 minutes	Outlet stack
SOx emissions	AQMD Laboratory Method 307-91	Not Applicable	Fuel sample
PM emissions	District method 5.1	1 hour minimum	Outlet stack

The test shall be conducted after SCAQMD approval of the source test protocol, but no later than 180 days after initial start-up. The SCAQMD shall be notified of the date and time of the test at least 10 days prior to the test. The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (mmcf/hour), and the flue gas flow rate.

The test shall be conducted in accordance with SCAQMD approved test protocol. The protocol shall be submitted to the SCAQMD engineer no later than 45 days before the proposed test date and shall be approved by the SCAQMD before the test commences.

The test protocol shall include the proposed operating conditions of the boiler during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted for 15 minutes for each load, while firing at maximum, minimum and low firing rates.

The test shall be conducted for compliance verification of the 25 ppmv CO limit.

The test shall be conducted for compliance verification of the 9 ppmv NOx limit.

Two complete copies of source test reports (include the application number and a copy of the permit in the report) shall be submitted to the District (addressed to South Coast Air Quality Management District, Attention: Roy Olivares (or Successor), P.O. Box 4941, Diamond Bar, CA 91765). The results in writing shall be submitted within 45 days after the source test is completed. It shall include, but not be limited to emissions rate in pounds per hour and concentration in ppmv at the outlet of the boiler.

A testing laboratory certified by the SCAQMD laboratory approval program (LAP) in the required test methods for criteria pollutant to be measured, and in compliance with District rule 304 (no conflict of interest) shall conduct the test.

Sampling facilities shall comply with the SCAQMD “guidelines for construction of sampling and testing facilities,” pursuant to Rule 217.

Rule 1303(a)(1) – BACT, rule 1303(b)(2) – Offset, Rule 2005, Reg. 1703 (a-PSD-BACT).

**VERIFICATION:** The project owner shall submit to the CPM for review and the District for approval, the project owner’s proposed test protocol. The project owner shall submit evidence of the District’s approval of the test protocol within 5 days of receipt. The project owner shall submit a report documenting results of the testing no less than 30 days after producing the report.

**AQ-43** The project owner shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District Method 100.1	60 minutes	Outlet stack

The test shall be conducted at least once every five years.

The test shall be conducted for compliance verification of the 9 ppmv NOx RECLAIM concentration limit. (Rule 2012.)

**VERIFICATION:** The project owner shall submit a report documenting results of the testing no less than 30 days after producing the report.

**AQ-44** This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM	40CFR60, SUBPART	Dc
SOX	40CFR60, SUBPART	Dc

**VERIFICATION:** None required.

**AQ-45** This equipment shall not be operated unless the facility holds 565 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operations. In addition, this equipment shall not be operated unless the project owner demonstrates to the SCAQMD executive officer that, at commencement of each compliance year after the start of operation, the facility holds 563 pounds RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by hold RTCs may be transferred upon their respective expiration

dates. His hold amount is addition to any other amount of RTCs required to be held under condition(s) stated in this permit. (Rule 2005.)

**VERIFICATION:** The project owner shall transmit a copy of their procurement document verification annually. As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-46** The project owner shall keep records in a manner approved by the SCAQMD Executive Officer, for the following parameter(s) or item(s):

Retain all records required by permit for a period of five years and make all records available to district personnel upon request.

The project owner shall record and maintain the amount of all fuel combusted during each calendar month. The fuel usage records shall be kept for a period of five years and all records shall be made available to district personnel upon request.

(Rule 1303 (b)(2), 40 CFR 60, subpart Dc.)

**VERIFICATION:** None required.

The following conditions apply individually to each diesel-fueled internal combustion engine used to power an emergency generator or emergency fire pump:

**AQ-47** The project owner shall only use diesel fuel containing the following specified compounds:

COMPOUND	Range	PPM BY WEIGHT
Sulfur	Less than or equal to	15

The project owner shall maintain a copy of the MSDS on site.

(Rule 431.2, rule 1303 (a)-BACT, rule 1470, 40 CFR 60, subpart IIII.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-48** The project owner shall limit the operating time to no more than 200 hours in any one year.

(Rule 1110.2, rule 1304, rule 1303 (a), rule 2005, rule 1470, rule 1714.)

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall report operating time for the previous quarter, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-49** The project owner shall limit the operating time to no more than 4.2 hours in any one month.

For the purposes of this condition, the operating time is inclusive of time allotted for maintenance and testing.

(Rule 1304, rule 2012.)

**VERIFICATION:** See Verification for **AQ-48**.

**AQ-50** The project owner shall install and maintain a(n) non-resettable elapsed meter to accurately indicate the elapsed operating time of the engine.

(Rule 1110.2, rule 1304, rule 1470, rule 2012, 40 CFR 60, subpart IIII.)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly. The project owner shall submit all dates of operation, elapsed time in hours, and the reason for each operation in the Quarterly Operations Report (**AQ-SC9**).

**AQ-51** The project owner shall comply with the following requirements:

The project owner shall comply with the emission standards specified in 40 CFR 60.4205(B) by purchasing an engine certified to the emission standards in 40 CFR 60.4205(B), as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission related specifications. (40 CFR 60.4211(c).)

**VERIFICATION:** The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered professional engineer stating that said engineer has reviewed the as-built designs or inspected the identified equipment and certifies that the appropriate devices have been installed and are functioning properly.

**AQ-52** The project owner shall comply with the following requirements.

The project owner shall operate and maintain the stationary engine and control device according to the manufacturer's written emission-related

instructions (or procedures developed by the operator that are approved by the engine manufacturer), change only those emission-related settings that are permitted by the manufacturer, and meet the requirements of 40 CFR 89, 94 and/or 1068, as they apply. (40 CFR 60.4211(a).)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-53** This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
PM	District Rule	1470
Sulfur	District Rule	431.2

(Rule 431.2, rule 1470.)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

**AQ-54** The project owner shall keep records in a manner approved by the SCAQMD Executive Officer, for the following parameter(s) or item(s):

Manual and automatic operation and shall list all engine operations in each of the following areas:

- A. Emergency use;
- B. Maintenance and testing; and
- C. Other (be specific).

In addition, for each time the engine is manually started, the log shall include the date of engine operation, the specific reason for operation, and the totalizing hour meter reading (in hours and tenths of hours) at the beginning and the end of the operation. (Rule 1110.2, rule 1470, 40 CFR 60.4214 (b).)

**VERIFICATION:** As part of the quarterly emissions report required by Condition of Certification **AQ-SC9**, the project owner shall report operating time for the previous quarter, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-55** The project owner shall keep records in a manner approved by the SCAQMD Executive Officer, for the following parameter(s) or item(s):

On or before January 15<sup>th</sup> of each year, the project owner shall record in the engine operating log:

- A. the total hours of engine operation for the previous calendar year; and
- B. The total hours of engine operation for maintenance and testing for the previous calendar year.

Engine operation log(s) shall be retained on site for a minimum of five calendar years and shall be made available to the SCAQMD Executive Officer or representative upon request. (Rule 1304.)

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall report operating time for the previous quarter, assert that they comply with this condition, and report any instances of noncompliance.

The following condition applies individually to each diesel-fueled internal combustion engine used to power an emergency generator:

**AQ-56** The project owner shall limit the operating time to no more than 30 minutes in any one day. For the purposes of this condition, the operating time is inclusive of time allotted for maintenance and testing (CEQA).

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall report operating time for the previous quarter, assert that they comply with this condition, and report any instances of noncompliance.

*The following condition applies individually to each 3633 BHP diesel-fueled internal combustion engine used to power an emergency generator (facility total = 2):*

**AQ-57** This equipment shall not be operated unless the facility holds 5922 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operations. In addition, this equipment shall not be operated unless the project owner demonstrates to the SCAQMD Executive Officer that, at commencement of each compliance year after the start of operation, the facility holds 5922 pounds RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the

compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by hold RTCs may be transferred upon their respective expiration dates. His hold amount is addition to any other amount of RTCs required to be held under condition(s) stated in this permit. (Rule 2005.)

**VERIFICATION:** The project owner shall transmit a copy of their procurement document verification annually. As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

*The following condition applies to the 398 BHP diesel-fueled internal combustion engine powering an emergency generator (facility total = 1):*

**AQ-58** This equipment shall not be operated unless the facility holds 434 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operations. In addition, this equipment shall not be operated unless the project owner demonstrates to the SCAQMD Executive Officer, at commencement of each compliance year after the start of operation, the facility holds 434 pounds RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by hold, RTCs may be transferred upon their respective expiration dates. His hold amount is in addition to any other amount of RTCs required to be held under condition(s) stated in this permit. (Rule 2005.)

**VERIFICATION:** The project owner shall transmit a copy of their procurement document verification annually. As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

*The following condition applies individually to each 617 BHP diesel-fueled internal combustion engine powering an emergency fire pump (facility total = 3):*

**AQ-59** The project owner shall limit the operating time to no more than 50 hours in any one year. For the purposes of this condition, the operating time is inclusive of time allotted for maintenance and testing.

(Rule 1110.2, rule 1304, rule 2012, rule 1470.)

**VERIFICATION:** As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall report operating time for the previous quarter, assert that they comply with this condition, and report any instances of noncompliance.

**AQ-60** This equipment shall not be operated unless the facility holds 707 pounds of NOx RTCs in its allocation account to offset the annual emissions increase for the first year of operation. The RTCs held to satisfy the first year of operation portion of this condition may be transferred only after one year from the initial start of operations. In addition, this equipment shall not be operated unless the project owner demonstrates to the SCAQMD Executive Officer that, at commencement of each compliance year after the start of operation, the facility holds 707 pounds RTCs valid during that compliance year. RTCs held to satisfy the compliance year portion of this condition may be transferred only after the compliance year for which the RTCs are held. If the initial or annual hold amount is partially satisfied by hold RTCs may be transferred upon their respective expiration dates. His hold amount is addition to any other amount of RTCs required to be held under condition(s) stated in this permit. (Rule 2005.)

**VERIFICATION:** The project owner shall transmit a copy of their procurement document verification annually. As part of the Quarterly Emissions Report required by Condition of Certification **AQ-SC9**, the project owner shall assert that they comply with this condition and report any instances of noncompliance.

## **C. PUBLIC HEALTH**

### **DESCRIPTION OF MODIFICATIONS**

The modifications proposed in the Palen Solar Electric Generating System (PSEGS) petition include two 250-MW power-generating units (each consisting of a dedicated field of approximately 85,000 heliostats), a 750-foot solar tower and receiver, a power block, a natural-gas-fired auxiliary boiler, a natural-gas-fired night preservation boiler, a diesel-fired emergency fire pump system, a diesel-fired emergency electric generator system, a wet surface air condenser unit, an approximately 15-acre common facilities area located in the southwestern corner of the site with an administrative/warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the PSPP). Additional equipment includes mirror washing machines and site support vehicles, an approximately 203-acre temporary construction laydown area located in the southwestern portion of the site immediately north of the common facilities area, and a re-routed generation tie-line near the western end of the route and around the newly constructed Red Bluff Substation. The PSEGS project would eliminate the secondary emergency access road, reduce the project footprint from 4,366 acres to 3,794 acres, reduce the amount of grading by 4.3 million cubic yards (because the heliostat technology does not require an entirely flat surface), and increase NOx emissions from the use of nighttime preservation and auxiliary boilers. (Ex. 2000, p. 4.7-9.)

The following evidence on public health was received into evidence on October 29, 2013: Exhibits 1003, 1007, 1021, 1043, 1045, 1055, 1056, 1060, 1077, 2000, 2002, and 2008. (10/29/13 RT 36:21 – 37:15.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that with the implementation of the conditions of certification, the emissions of non-criteria pollutants from the construction and operation the PSPP would not pose a significant direct, indirect, or cumulative adverse public health risk. The Decision recognized that PSPP construction and operation of the project would result in the routine release of criteria and non-criteria pollutants that have the potential to adversely impact public health, including diesel particulate emissions, toxic non-criteria pollutants, and fugitive dust. However the PSPP Decision found that exposure to diesel particulate emissions from construction equipment is short-term and would not result in long-term carcinogenic or non-carcinogenic health effects. The PSPP Decision found that exposure to construction-related diesel particulates as well as fugitive dust due to excavation and construction activities would be mitigated to insignificant levels by implementing measures to reduce equipment emissions and dust production and dispersal. The PSPP Decision found that acute and chronic hazard risks, cancer risks, and risks

associated from Legionella arising from project operations are below the level of significance. The cumulative impacts of the PSPP combined with emissions from the Interstate 10 (I-10) highway were found to be insignificant. (PSPP Final Decision, CEC-800-2010-011, **PUBLIC HEALTH**, pp. 5-8.)

## **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

### **Construction Impacts and Mitigation**

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation and diesel exhaust from heavy equipment operation. The record indicates that there is no evidence or record of any use, spillage, or disposal of hazardous substances on the site, or any other environmental concern that would require remedial action. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in the **AIR QUALITY** section of this Decision. (Ex. 2000, pp. 4.7-12 – 4.7-13.)

The operation of construction equipment would result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. Diesel exhaust also contains over 40 substances that are listed by the U.S. Environmental Protection Agency (USEPA) as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants. Exposure to diesel exhaust may cause both short- and long-term adverse health effects. Short-term effects can include increased coughing, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer. Diesel exhaust is listed by the USEPA as “likely to be carcinogenic to humans.” (Ex. 2000, p. 4.7-13.)

In 2000, ARB developed a “Risk Reduction Plan to Reduce Particulate Matter Emissions From Diesel-Fueled Engines and Vehicles” and has been developing regulations to reduce diesel particulate matter emissions since that time. Construction of the PSEGS, including site preparation, is anticipated to take place over a period of 33 months. The record indicates that the assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from 8 to 70 years. (Ex. 2000, p. 4.7-13.)

**Public Health - Table 1**, below, compares the Energy Commission Staff’s analysis of the health risk assessment for diesel exhaust from construction activities to that of the

Petitioner. Both parties' analyses conclude that the health risk for diesel particulate matter is well below the level of significance. (Ex. 2000, p. 4.7-15.)

**Public Health - Table 1  
Construction Hazard/Risk from Diesel Particulate Matters (DPM's)**

	<b>Cancer Unit Risk (<math>\mu\text{g}/\text{m}^3</math>)<sup>-1</sup></b>	<b>Cancer Risk (in one million)</b>	<b>Significance Level</b>	<b>Significant?</b>
<b>Project owner's Analysis<sup>a</sup></b>	9.3x10 <sup>-6</sup>	0.38	10	No
<b>Staff's Analysis<sup>b</sup></b>	38.7x10 <sup>-6</sup>	1.58	10	No
	<b>Chronic Noncancer REL (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Hazard Index (HI)</b>		
	5	8.17x10 <sup>-3</sup>	1	No

<sup>a</sup> Assumed for a 3-year exposure period (20 hours per day, 6 days per week, 52 weeks per year). Source: Palen 2013l.

<sup>b</sup> Assumed for a 9-year exposure period. (Ex. 2000, p. 4.7-15.)

Mitigation measures to reduce the maximum calculated PM10 and PM2.5 concentrations include the use of extensive fugitive dust control measures that are assumed to result in a 50 percent reduction of fugitive dust emissions. In order to mitigate potential impacts from construction-related particulate emissions during the operation of diesel-powered construction equipment, ultra low-sulfur diesel fuel and the installation of an oxidation catalyst and soot filters on diesel equipment is required. The catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is comparable for both mitigation measures in the range of approximately 85 percent to 92 percent. Such filters would reduce diesel combustion emissions during construction and further reduce the impacts associated with diesel exhaust below significance. (See the **AIR QUALITY** section of this Decision regarding measures to control particulate matter). (Ex. 2000, p. 4.7-15.)

The project owner would use a concrete batch plant during the construction phase of the project. The operation of the concrete batch plant would result in increased toxic air contaminant (TAC) emissions during construction as well as increased diesel exhaust and fugitive dust emissions. Emissions of volatile TAC's from on-site diesel and gasoline fuel storage would also occur. The evidence establishes that the increased emissions are minimal and would not add significantly to public health impacts during construction. Given the isolated nature of the power plant from residences and commercial operations where the public would congregate for a period of time (as opposed to rapidly moving through the area when traveling on I-10), we find that the risks would not be significant to any on-site or off-site receptor. (Ex. 2000, p. 4.7-15.)

Construction would disturb a certain percentage of approximately 5,200 acres of top soil that could harbor the *Coccidioides* spores possibly exposing humans to the risk of

Valley Fever. On-site workers could be exposed from inhaling these fungal spores from wind-blown dust generated from soil excavation construction activities. (Ex. 2000, p. 4.7-15.)

The record contains specific recommendations from the federal Centers for Disease Control and Prevention (CDC) and the California Department of Public Health (CDPH), which are all preventive actions, not a guarantee of protection from Valley Fever. Based on CDC and CDPH's recommendations, we would require that project workers in the vicinity of such dust generation areas wet the soil before any excavation activities, wear protective masks and stay indoors during dust storms, and close all doors to avoid dust inhalation. The evidence indicates that the project owner's dust suppression plans are adequate to minimize the risk of getting Valley Fever in areas where *Coccidioides* spores are found. Please refer to the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision for more information. (Ex. 2000, p. 4.7-16.)

As for the concerns of Valley Fever affecting the general population, the **AIR QUALITY** section of this Decision contains mitigation measures, including Conditions of Certification **AQ-SC3** (Construction Fugitive Dust Control) and **AQ-SC4** (Dust Plume Response Requirement) for the purposes of preventing all fugitive dust plumes from leaving the project boundary. As long as the dust plumes are kept within the project boundary, there would not be any significant risk for Valley Fever adversely affecting the general population and public health. (Ex. 2000, p. 4.7-16.)

### **Operational Impacts and Mitigation**

The emissions sources at the PSEGS site for both power blocks include two natural gas-fired auxiliary boilers, two natural gas-fired night preservation boilers, two wet surface air condensers (WSAC) units, two diesel-fired emergency electrical generators, two diesel-fired emergency fire pumps, mirror washing machines and site support vehicles. Additional emission sources in the common area include one fire pump engine, one emergency electrical generator, and one mirror washing machine. In summary, there are a total of 19 emitting units, which were modeled by the project owner for facility operations, including:

- 2 auxiliary boilers;
- 2 night preservation boilers;
- 8 WSAC units;
- 3 emergency electric generator systems;
- 3 emergency fire pump systems; and
- 1 on-site piece of equipment for mirror washing (Ex. 2000, p. 4.7-17).

The record contains lists of TACs that may be emitted by the project. **Public Health - Table 2** lists each TAC, their exposure routes and how they would contribute to the total risk obtained from the risk analysis. Toxicity values include Reference Exposure Levels (REL), which are used to calculate short-term and long-term noncancerous health effects, and cancer unit risks which are used to calculate the lifetime risk of developing cancer, are listed in **Public Health - Table 3**. (Ex. 2000, p. 4.7-17.)

**Public Health - Table 2**  
**Types of Health Impacts and Exposure Routes Attributed to Toxic Emissions**

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✓	✓	✓
Acrolein				✓	✓
Ammonia				✓	✓
Benzene			✓	✓	✓
1,3-Butadiene			✓	✓	
Ethylbenzene			✓	✓	
Formaldehyde			✓	✓	✓
Hexane				✓	
Napthalene			✓	✓	
Polycyclic Aromatic Hydrocarbons (PAHs, as BaP)	✓		✓		
Propylene				✓	
Propylene Oxide			✓	✓	✓
Toluene				✓	✓
Xylene				✓	✓
Diesel Exhaust			✓	✓	
Arsenic	✓	✓	✓	✓	✓
Beryllium		✓	✓	✓	
Biphenyl*					
Chromium (Hexavalent)		✓	✓	✓	
Copper					✓
Nickel		✓	✓	✓	✓
Manganese				✓	
Selenium				✓	
Mercury		✓		✓	✓
Zinc*					

\*No cancer risk factors or RELs have been established for biphenyl and zinc. Source: ARB 2011(Ex. 2000, p. 4.7-18.)

**Public Health - Table 3  
Toxicity Values Used to Characterize Health Risks**

Toxic Air Contaminant	Inhalation Cancer Potency Factor (mg/kg-d) <sup>-1</sup>	Chronic REL (µg/m <sup>3</sup> )	Acute REL (µg/m <sup>3</sup> )
Acetaldehyde	0.010	140	470 (1-hr) 300 (8-hr)
Acrolein	—	0.35	2.5 (1-hr) 0.7 (8-hr)
Ammonia	—	200	3,200
Benzene	0.10	60	1,300
1,3-Butadiene	0.60	20	—
Ethylbenzene	0.0087	2,000	—
Formaldehyde	0.021	9	55 (1-hr) 9 (8-hr)
Hexane	—	7,000	—
Napthalene	0.12	9.0	—
Polycyclic Aromatic Hydrocarbons (PAHs, as BaP)	3.9	—	—
Propylene	—	3000	—
Propylene oxide	0.013	3	3100
Toluene	—	300	37,000
Xylene	—	700	22,000
Diesel Particulate Matter	1.1	5	—
Arsenic	12	0.015	0.2
Beryllium	8.4	0.007	—
Biphenyl*	—	—	—
Chromium (Hexavalent)	510	0.2	—
Copper	—	—	100
Nickel	0.91	0.05	6
Manganese	—	0.09	—
Selenium	—	20	—
Mercury	—	0.03	0.6
Zinc*	—	—	—

\*No cancer risk factors or RELs have been established for biphenyl and zinc.

Source: ARB 2011 (Ex. 2000, p. 4.7-19.)

The cancer and noncancerous risks from the PSEGS operation are significantly below their respective significance levels. This means that no health impacts would occur within all segments of the surrounding population. There are no sensitive receptors, such as schools (either public or private), day care facilities, nursing homes or hospitals identified within a 6-mile radius of the site. As shown in **Public Health - Table 4**, the cancer risk for workers is below the significance level. Therefore, we find no need for conditions of certification to protect public health, except for Legionella, discussed below. Both Staff and Petitioner conducted detailed analyses of the acute and chronic

cancer and non-cancer health risks associated with the operation of the PSEGS. **Public Health - Table 4** below summarizes Petitioner’s analysis and **Public Health - Table 5**, below, summarizes Staff’s analysis. (Ex. 2000, p. 4.7-20.)

**Public Health - Table 4**  
**Results of Petitioner’s Analysis: Operation Hazard/Risk at Point of Maximum Impact**

Type of Hazard/Risk	Hazard Index/Risk	Significance Level	Significant?
Acute Noncancerous	0.000276	1.0	No
Chronic Noncancerous	0.000683	1.0	No
Individual Cancer	1.08 in 1 million	10 in 1 million	No

Source: Table 4.1-29 of project owner’s Supplement No. Two – Complete Air Quality and Public Health sections (Palen 2013ff). (Ex. 2000, p. 4.7-20.)

**Public Health - Table 5**  
**Results of Staff Analysis: Cancer Risk and Chronic Hazard from PSEGS Operations**

Receptor Location	Cancer Risk (per million)	Chronic HI <sup>d</sup>	Acute HI <sup>d</sup>	Significant?
PMI <sup>a</sup>	1.41	6.83x10 <sup>-4</sup>	8.09x10 <sup>-4</sup>	No
Residence MEIR <sup>b</sup>	0.0151	7.58x10 <sup>-5</sup>	1.3x10 <sup>-4</sup>	No
Worker MEIW <sup>c</sup>	0.214	-	-	No
at a Sensitive Receptor	-	-	-	No
Significance level	10	1	1	

<sup>a</sup> PMI = Point of Maximum Impact

<sup>b</sup> MEIR = MEI of residential receptors. Location of the residence of the highest risk with a 70-year residential scenario.

<sup>c</sup> MEIW = MEI for workers. Occupational exposure patterns assuming exposure of 8 hours/day, 245 days/year for 40 years.

<sup>d</sup> HI = Hazard Index (Ex. 2000, p. 4.7-22.)

## Legionella

To conserve water in the desert environment, each PSEGS plant would use an air-cooled condenser for the main steam-cycle. However, a WSAC would be used for auxiliary equipment cooling. Since the facility would mainly use dry cooling, there would be no emissions of toxic metals or volatile organic compounds from cooling tower mist or drift. In addition to being a source of potential TAC (in particular beryllium and copper due to the project’s use of groundwater that contains trace amounts of these

substances), the possibility exists for bacterial growth to occur in the eight WSACs (four at each power block). Legionella is a bacterium that is ubiquitous in natural aquatic environments and is also widely distributed in man-made water systems. It is the principal cause of Legionellosis, otherwise known as Legionnaires' disease, which is similar to pneumonia. Transmission to people results mainly from inhalation or aspiration of aerosolized contaminated water. Untreated or inadequately treated cooling systems, such as industrial cooling towers and building heating, ventilating, and air conditioning systems, have been correlated with outbreaks of Legionellosis. (Ex. 2000, p. 4.7-23.)

In order to ensure that Legionella growth is kept to a minimum, we would again impose Condition of Certification **PUBLIC HEALTH-1. PUBLIC HEALTH-1** has already been approved and already existed in the PSPP certification. The condition requires the project owner to prepare and implement a biocide and anti-biofilm agent monitoring program to ensure that proper levels of biocide and other agents are maintained within the two cooling towers' water at all times, that periodic measurements of Legionella levels are conducted, and that periodic cleaning is conducted to remove bio-film buildup. The evidence shows that with the use of an aggressive antibacterial program, coupled with routine monitoring and biofilm removal, the chances of Legionella growing and dispersing would be reduced to insignificance. (Ex. 2000, p. 4.7-24.)

### **SCE Red Bluff Substation**

In order to transmit the power generated by the PSEGS to the electricity grid, Southern California Edison Company (SCE) is constructing the Red Bluff Substation, which would allow the electricity to be carried by the Devers–Palo Verde No. 1 (DPV1) 500 kV transmission line. The SCE Red Bluff Substation is expected to be operational in December 2013. The evidence indicates that the construction phase of SCE Red Bluff Substation and the PSEGS would not overlap. Therefore, the only health impacts would be exposure to electromagnetic fields (EMF) from power transmission and safety concerns for workers. EMF is discussed in the **TRANSMISSION LINE SAFETY AND NUISANCE** section of this Decision. Worker safety is discussed in the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision. (Ex. 2000, p. 4.7-25.)

### **Non-Operation and Facility Closure Impacts and Mitigation**

Closure of the PSEGS would follow a facility closure plan prepared by the project owner and designed to minimize public health and environmental impacts. The evidence shows that impacts to public health from the non-operation or facility closure process would represent a fraction of the impacts associated with the construction or operation of the PSEGS. Therefore, we conclude that public health-related impacts from non-operation or facility closure are insignificant. (Ex. 2000, p. 4.7-25.)

## **Cumulative Impacts**

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (California Code of Regulations, title 14, section 15130.)

The geographic scope of analysis for cumulative effects to public health is a 6-mile buffer zone around the project site. The record contains an analysis of the potential impacts due to construction and operation of the PSEGS in combination with new projects or new "reasonably foreseeable probable future projects" in the area since the PSPP project was approved, and none of them fall within the 6-mile buffer zone. Therefore, we conclude that there would not be any cumulatively considerable impacts associated with public health risks. (Ex. 2000, p. 4.7-10.)

We find that the PSEGS project, if built and operated in conformance with the existing conditions of certification, would produce no significant direct, indirect or cumulative public health impacts on people within the project area.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

We have found no potential significant adverse impacts for any receptors, including environmental justice populations. Staff's analysis complies with all directives and guidelines from the Cal/EPA Office of Environmental Health Hazard Assessment and the ARB. The underlying assessment is biased toward the protection of public health and takes into account the most sensitive individuals in the population. Using extremely conservative (health-protective) exposure and toxicity assumptions, Staff's analysis demonstrates that members of the public potentially exposed to toxic air contaminant emissions of this project (including sensitive receptors such as the elderly, infants, and people with pre-existing medical conditions) would not experience any significant chronic or cancer health risk as a result of that exposure. The evidence indicates that Staff's analysis incorporated every conservative assumption called for by state and federal agencies responsible for establishing methods for analyzing public health impacts. The results of that analysis indicate that there would be no direct or cumulative significant public health and safety impact to any population in the area. Therefore, given the absence of any significant health impacts, there are no disparate health impacts and there are no environmental justice issues associated with public health. We find that construction and operation of the PSEGS would comply with all applicable LORS regarding long-term and short-term project impacts in the area of public health.

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project would be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

It is noteworthy that a solar electric generating facility such as the proposed PSEGS project would emit significantly less TACs to the environment than other energy sources available in California such as natural gas or biomass, thereby reducing the health risks that would otherwise occur with these non-renewable energy sources. At the same time, the proposed PSEGS would provide much needed electrical power to California residences and businesses, and would contribute to electricity supply. Electrical power is not only necessary to maintain a functioning society, but it also benefits many individuals who rely on powered equipment for their health (such as dialysis equipment and temperature control equipment). For example, it is documented that during heat waves in which elevated air-conditioning use causes an electrical blackout, hospitalizations and deaths due to heat stroke are increased. (Ex. 2000, p. 4.7-26.)

Changing from PSPP's trough solar collection system to PSEGS's solar tower technology would eliminate the use of Therminol VP1, the heat transfer fluid used in trough technology. Therminol VP1 is a mixture of 73.5 percent diphenyl ether and 26.5 percent biphenyl. The PSPP would have required storage of approximately 2,600,000 gallons of Therminol VP1, which, when heated, breaks down causing emissions of volatile organic compounds (VOC) containing toxic decomposition products including benzene. (PSPP Final Decision, CEC-800-2010-011, HAZARDOUS MATERIALS MANAGEMENT, pp. 3-4.)

Moreover, changing from a trough solar collection system to solar tower technology would be more suitable for endemic areas of Valley Fever. This is because the heliostat technology does not require an entirely flat surface and would substantially decrease the disturbance of the top soil. (Ex. 2000, p. 4.7-26.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding the public health.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. There is no evidence or record of any use, spillage, or disposal of hazardous substances on the PSEGS project site, or any other environmental concern that would require remedial action.
2. The health risk for diesel particulate matter during the PSEGS plant construction would be well below the level of significance.
3. Project construction would last 33 months.
4. The operation of the concrete batch plant would result in a minimal increase in TAC emissions during construction as well as increases in diesel exhaust and fugitive dust emissions, however, the increased emissions would not add significantly to public health impacts during construction.
5. The project owner's dust suppression plans are adequate to minimize the risk of Valley Fever to below significance.
6. The record contains a list of toxic air contaminants that may be emitted by the project.
7. The cancer and noncancerous risks from the PSEGS operation would be significantly below their respective significance level, which means that no health impacts would occur within all segments of the surrounding population.
8. There are no sensitive receptors, such as schools (either public or private), day care facilities, nursing homes, or hospitals, identified within a six-mile radius of the site.
9. The use of an aggressive antibacterial program, coupled with routine monitoring and biofilm removal, would reduce the chances of Legionella growing and dispersing at the PSEGS project site to below the level of significance.
10. Public-health-related impacts from closure and decommissioning of the PSEGS would be insignificant.
11. PSEGS' public-health-related impacts, in combination with other projects in the vicinity of the project, would not be cumulatively considerable.

12. Conditions of certification and adherence to LORS would ensure that workers at the PSEGS facility would be adequately protected from construction and operational public health related impacts.
13. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

### **CONCLUSIONS OF LAW**

1. PSEGS would comply with all applicable public-health-related LORS and would produce no significant direct, indirect, or cumulative public-health-related impacts on people within the project area.
2. The change in the project would be beneficial to the public, Petitioner, and intervenors, because the heliostat technology would not require an entirely flat surface that would decrease the disturbance of the top soil, therefore, reducing risks associated with Valley Fever. Furthermore, changing from PSPP's trough solar collection system to PSEGS' solar tower technology would eliminate the use and storage of approximately 2,600,000 gallons of Therminol VP1, which would emit volatile organic compounds (VOC) containing toxic decomposition products, including benzene.
3. There has been a substantial change in circumstances since the original approval, because at the time of the original licensing, the project was wholly-owned by Solar Millennium. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

### **CONDITION OF CERTIFICATION**

The following condition of certification is essentially identical to the single condition of certification recommended for the previously-approved PPSP.

**PUBLIC HEALTH-1** The project owner shall develop and implement a Cooling Water Management Plan to ensure that the potential for bacterial growth in cooling water is kept to a minimum. The Plan shall be consistent with either Staff's "Cooling Water Management Program Guidelines" or with the Cooling Technology Institute's "Best Practices for Control of Legionella" guidelines, but in either case, the Plan must include sampling and testing for the presence of Legionella bacteria at least every six months. After two years of power plant operations, the project owner may ask the Compliance Project Manager to re-evaluate and revise the Legionella bacteria testing requirement.

**VERIFICATION:** At least 60 days prior to the commencement of cooling tower operations, the Cooling Water Management Plan shall be provided to the CPM for review and approval.

## **D. WORKER SAFETY AND FIRE PROTECTION**

### **DESCRIPTION OF MODIFICATIONS**

On December 17, 2012, Palen Solar Holdings, LLC (PSH) filed a petition with the Energy Commission requesting to modify the Palen Solar Power Project (PSPP) now called Palen Solar Energy Geothermal System (PSEGS). The major modification is replacing the parabolic trough solar collection system using heat transfer fluid with BrightSource's solar tower technology. Heliostats (elevated mirrors guided by a tracking system mounted on a pylon) focus the sun's rays on a solar receiver steam generator located atop a 750-foot tower near the center of each solar field to create steam to drive a turbine that generates electricity. (Ex. 2000, p. 4.14-5.)

Two adjacent solar fields producing 250 MW each are proposed for a combined nominal output of approximately 500 MW. Each of the 250 MW solar fields would have a dedicated tower, solar field/heliostat array of approximately 85,000 heliostats and a dedicated steam turbine generator/power block. Both solar fields would share common facilities, including a common area containing an administration building, warehouse, evaporation ponds, maintenance complex, a meter/valve station for incoming natural gas service to the site, an on-site switchyard, and a 10-mile single-circuit 230-kV generation tie line. Other on-site facilities would include access and maintenance roads (either dirt, gravel, or paved), perimeter fencing, tortoise fencing, and other ancillary security facilities. (Ex. 2000, p. 4.14-5.)

The following evidence on worker safety and fire protection was received into evidence on October 29, 2013: Exhibits 1003, 1012, 1019, 1030, 1041, 1051, 1057, 1059, 1060, 1077, 2000, 2002, 2003, 2008, and 2012. (10/29/13 RT pp. 256:18 – 257:17.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that implementation of the conditions of certification and the mitigation measures described in the evidentiary record, the PSPP would not result in significant health and safety impacts to on-site workers and would comply with all applicable laws, ordinances, regulations, and standards (LORS). The Decision established that industrial workers at the project site and along the linear corridors would be exposed to potential safety and health hazards on a daily basis. To protect workers from job-related injuries and illnesses, the project owner would implement comprehensive Safety and Health Programs for both the construction and the operation phases of the project, which would include a Worker Heat Stress Protection Plan to address working conditions in the extreme desert heat, and Best Management Practices to prevent worker exposure to herbicides used to remove vegetation at the site. The Safety and Health Programs would include enhanced dust control and prevention measures to protect workers from exposure to Valley Fever

Worker Safety and Fire Protection

and would also include measures to protect workers from exposure to unexploded ordnance and other munitions remnants that could be encountered at the site. PSPP would employ an on-site professional safety monitor during construction and operation. The PSPP would include on-site fire protection and suppression systems as the first line of defense in the event of a fire. The Decision instructed Riverside County Fire Department (RCFD) to provide fire protection and emergency response services to the Project and participate in annual training of solar plant personnel in hazardous materials (HazMat) emergency response. To ensure that fire and emergency service resources were adequate to meet PSPP's needs, the project owner was required to negotiate a mitigation fee, either individually or as part of a solar power plant group with the RCFD, to pay for the capital costs of building and upgrading RCFD fire stations and to purchase necessary equipment to address the demand of Palen Solar and other large solar projects in Riverside County. The mitigation fee agreement with the RCFD was to address the Palen Solar Power Project's contribution to cumulative impacts on the RCFD's resources due to several large new solar projects in Riverside County. (PSPP Final Decision, CEC-800-2010-011, **WORKER SAFETY AND FIRE PROTECTION**, pp. 8-9.)

## **THE AMENDED PROJECT'S IMPACTS**

### **Worker Safety**

Industrial environments are potentially dangerous during construction and operation of facilities. Workers at the PSEGS facility would be exposed to loud noises, glint and glare, moving equipment, trenches, and confined space entry and egress problems. The workers may experience falls, trips, burns, lacerations, and numerous other injuries. They have the potential to be exposed to falling equipment or structures, chemical spills, hazardous waste, fires, explosions, and electrical sparks and electrocution. It is important for the PSEGS to have well-defined policies and procedures, training, and hazard recognition and control at its facility to minimize such hazards and protect workers. If the facility complies with all LORS and conditions of certification, workers would be adequately protected from health and safety hazards. (Ex. 2000, p. 4.14-6.)

The project owner must prepare a Safety and Health Program to minimize worker hazards during construction and operation. "Safety and Health Program" refers to the measures to be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project. (Ex. 2000, p. 4.14-7.)

## **Construction Safety and Health Program**

Workers at the PSEGS would be exposed to hazards typical of construction and operation of a solar thermal electric power generating facility. (Ex. 2000, p. 4.14-7.)

Construction Safety Orders are published at California Code of Regulations, title 8, sections 1502, et seq. These requirements are promulgated by Cal/OSHA and apply to the construction phase of the project. The Construction Safety and Health Program must include the following:

- Construction Injury and Illness Prevention Program (8 Cal. Code Regs., §1509);
- Construction Fire Prevention Plan (8 Cal. Code Regs., §1920);
- Personal Protective Equipment Program (8 Cal. Code Regs., §§1514-1522); and
- Emergency Action Program and Plan (Ex. 2000, p. 4.14-7).

Additional programs under General Industry Safety Orders (8 Cal. Code Regs., §§3200 to 6184), Electrical Safety Orders (8 Cal. Code Regs., §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal. Code Regs., §§450 to 544) include:

- Electrical Safety Program;
- Motor Vehicle and Heavy Equipment Safety Program;
- Forklift Operation Program;
- Excavation/Trenching Program;
- Fall Protection Program;
- Scaffolding/Ladder Safety Program;
- Articulating Boom Platforms Program;
- Crane and Material Handling Program;
- Housekeeping and Material Handling and Storage Program;
- Respiratory Protection Program;
- Employee Exposure Monitoring Program;
- Hand and Portable Power Tool Safety Program;
- Hearing Conservation Program;
- Back Injury Prevention Program;
- Ergonomics Program;

- Heat and Cold Stress Monitoring and Control Program;
- Hazard Communication Program;
- Lock Out/Tag Out Safety Program;
- Pressure Vessel and Pipeline Safety Program; and
- Solar Components Safe Handling Program (Ex. 2000, pp. 4.14-7 – 4.14-8).

The record contains adequate outlines of each of these programs and the PSPP outlines continue to apply to PSEGS. Prior to the start of the construction of PSEGS, detailed programs and plans must be provided to the Energy Commission Compliance Project Manager (CPM) and to the RCFD pursuant to the Condition of Certification **WORKER SAFETY-1**. (Ex. 2000, p. 4.14-8.)

### **Operations and Maintenance Safety and Health Program**

The PSEGS project owner must prepare the Operations and Maintenance Safety and Health Program prior to the start of operations. This operational safety program must include the following programs and plans:

- Injury and Illness Prevention Program (8 Cal. Code Regs., §3203);
- Fire Protection and Prevention Program (8 Cal. Code Regs., §3221);
- Personal Protective Equipment Program (8 Cal. Code Regs., §§3401 to 3411); and
- Emergency Action Plan (8 Cal. Code Regs., §3220).

In addition, the requirements under General Industry Safety Orders (8 Cal. Code Regs., §§3200 to 6184), Electrical Safety Orders (8 Cal. Code Regs., §§2299 to 2974) and Unfired Pressure Vessel Safety Orders (8 Cal. Code Regs., §§450 to 544) apply to the project. Written safety programs for PSEGS, which the project owner must develop, ensure compliance with the above-mentioned requirements. (Ex. 2000, p. 4.14-8.)

The record contains adequate outlines of the Injury and Illness Prevention Program, Emergency Action Plan, Fire Prevention Program, and Personal Protective Equipment Program. The PSPP outlines continue to apply to PSEGS. Prior to operation of PSEGS, all detailed programs and plans must be provided to the CPM and RCFD pursuant to Condition of Certification **WORKER SAFETY-2**. (Ex. 2000, p. 4.14-8.)

### **Safety and Health Program Elements**

As mentioned above, the Petitioner provided proposed outlines for both a Construction Safety and Health Program and an Operations Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law.

Both safety and health programs are comprised of six more specific programs and require the major items detailed in the following paragraphs. (Ex. 2000, p. 4.14-8.)

### **Injury and Illness Prevention Program**

The Injury and Illness Prevention Program (IIPP) must include the following components:

- Identity of person(s) with authority and responsibility for implementing the program;
- A safety and health policy of the plan;
- A definition of work rules and safe work practices for construction activities;
- A system for ensuring that employees comply with safe and healthy work practices;
- A system for facilitating employer-employee communications;
- Procedures for identifying and evaluating workplace hazards and developing necessary program(s);
- Methods for correcting unhealthy or unsafe conditions in a timely manner;
- Safety procedures; and
- Training and instruction. (Ex. 2000, pp. 4.14-8 – 4.14-9.)

### **Fire Prevention Plan**

The California Code of Regulations requires an Operations Fire Prevention Plan (8 Cal. Code Regs., §3221). The PSPP outlined a proposed Fire Prevention Plan that is acceptable for the PSEGS project. The plan would accomplish the following:

- Determine general program requirements (scope, purpose, and applicability);
- Determine potential fire hazards;
- Develop good housekeeping practices and proper handling and materials storage;
- Determine potential ignition sources and control measures for these sources;
- Determine persons responsible for equipment and system maintenance;
- Locate portable and fixed fire-fighting equipment in suitable areas;
- Establish and determine training and instruction requirements; and
- Define recordkeeping requirements. (Ex. 2000, p. 4.14-9.)

Under the existing license for the project, the project owner is required to submit a final Fire Prevention Plan to the CPM for review and approval and to the RCFD for review and comment to satisfy Conditions of Certification **WORKER SAFETY-1** and **WORKER**

**SAFETY-2.** The Best Management Practices for the storage and application of herbicides has been removed from Condition of Certification **WORKER SAFETY-2** because herbicides would not be used to control vegetation in the heliostat field. No other changes are being made to these two conditions. (Ex. 2000, p. 4.14-9.)

### **Personal Protective Equipment Program**

California regulations require Personal Protective Equipment (PPE) and first aid supplies whenever hazards are present that due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function as a result of absorption, inhalation, or physical contact (8 Cal. Code Regs., §§ 3380 to 3400). The PSEGS operational environment would require PPE. (Ex. 2000, p. 4.14-9.)

All safety equipment must meet National Institute of Safety and Health (NIOSH) or American National Standards Institute (ANSI) standards and would carry markings, numbers, or certificates of approval. Respirators must meet NIOSH and Cal/OSHA standards. Each employee must be provided with the following information pertaining to the protective clothing and equipment:

- Proper use, maintenance, and storage;
- When to use the protective clothing and equipment;
- Benefits and limitations; and
- When and how to replace the protective clothing and equipment. (Ex. 2000, p. 4.14-10.)

The PPE Program ensures that employers comply with the applicable requirements for PPE and provides employees with the information and training necessary to protect them from potential workplace hazards. (Ex. 2000, p. 4.14-10.)

### **Emergency Action Plan**

California regulations require an Emergency Action Plan (8 Cal. Code Regs., §3220). The PSPP contains a satisfactory outline for an Emergency Action Plan (Solar Millennium 2009a, section 5.18.3.2).

The outline lists plans to accomplish the following:

- Establish scope, purpose, and applicability;
- Identify roles and responsibilities;
- Determine emergency incident response training;
- Develop emergency response protocols;
- Specify evacuation protocols;

- Define post emergency response protocols; and
- Determine notification and incident reporting. (Ex. 2000, p. 4.14-10.)

### **Written Safety Program**

In addition to the specific plans listed above, additional LORS called “safe work practices” apply to the project. Both the Construction and the Operations Safety Programs address safe work practices under a variety of programs. The components of these programs include, but are not limited to, the programs found under the heading “Construction Safety and Health Program” in the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision. (Ex. 2000, p. 4.14-10.)

### **Safety Training Programs**

The project owner must provide training for employees in the safe work practices described in the above-referenced safety programs. (Ex. 2000, p. 4.14-10.)

### **Additional Safety Issues**

This solar power plant presents several unique work environments, the first of which involves a solar field located in the high desert. The solar field features thousands of heliostats (mirrors) that would focus intense solar flux on the top of a 750-foot tower. Workers would inspect the solar array for broken mirrors at least once each day by driving up and down dirt paths between the rows of mirrors and even under the mirrors, thus generating dust. Cleaning the mirrors would also be conducted according to a routine schedule. All these activities would take place year-round and especially during the summer months of peak solar power generation when outside ambient temperatures routinely reach 115°F and above. (Ex. 2000, p. 4.14-11.)

The existing Conditions of Certification **WORKER SAFETY-1** and **-2** include a worker heat stress protection plan that implements and expands on existing Cal/OSHA regulations (8 CCR 3395). The evidence indicates that effective implementation of a Heat Stress Protection Plan would mitigate the potential for significant risks to workers from heat during both construction and operations. It is imperative to keep track of heat illness incidents (including, but not limited to, heat stress, heat exhaustion, heat stroke, or heat prostration) to ensure that all worker protections are indeed being implemented and are adequate because heat-related illness and injury is highly probable in desert environments and has been documented at desert solar power plants under construction. Therefore, we impose the new Condition of Certification **WORKER SAFETY-12**, which requires the project owner to immediately report all heat-related incidents (regardless of whether they are reportable under OSHA regulations) to the CPM within 24 hours of occurrence. This would provide the Energy Commission with a

current data base of occurrences at all desert power plants to assist in determining the adequacy of worker protection. (Ex. 2000, p. 4.14-11.)

The second unique work environment involves the need to protect workers from the adverse effects of glint and glare coming from the tower and the heliostats. As described in the **TRAFFIC AND TRANSPORTATION** section of this Decision, the PSEGS is located in a bright desert environment with the potential for photochemical eye damage, specifically to the retina. The cumulative daily exposure of workers to the ambient environment combined with exposure of reflected sunlight from the heliostats and SRSG puts project workers at risk for retinal damage. To ensure the safety of the workers and others within the project boundaries, the project owner must provide employees with personnel protection equipment (PPE) in the form of protective glasses. (Ex. 2000, p. 4.14-11.)

Protective glasses have been developed for workers engaged in intense solar field work, tower work, and intense close viewing of the SRSG. There is precedent for the issuance of special safety glasses, for example they have been issued to the operators at BrightSource's Solar Energy Development Center (SEDC) in Israel, and BrightSource's Coalinga and Ivanpah solar thermal plants. Conditions of Certification **WORKER SAFETY-1** (Project Construction Safety and Health Program) and **WORKER SAFETY-2** (Project Operations and Maintenance Safety and Health Program) both include this requirement. (Ex. 2000, pp. 4.14-11 – 4.14-12.)

The third unique work environment involves working in an elevated enclosed location, the inside of and atop the two 750-foot solar towers. Experience and site visits to the existing nearly 500-foot towers at the Ivanpah facility demonstrate the need for the project owner to address this unique work environment. Worker access to the towers must be controlled and monitored so that it is known at all times and with great precision the number of workers inside the towers. Small fires have occurred in the more open steel-structure towers at Ivanpah. The ability to detect and suppress such a fire in PSEGS's fully enclosed concrete towers would require more scrutiny and safety procedures. Fire department ladder trucks can only reach a height of approximately 100 feet so the internal elevator provides the best access for rescue from inside or from the top of these towers. The need for a safe and effective elevator system and emergency hoist system is critical. (Ex. 2000, p. 4.14-12.)

The project owner would implement the following safety measures:

1. Tower Access would be provided by a rack-and-pinion industrial-type elevator and a staircase;

2. The elevators would be connected to both grid power and to the plant essential services bus bar powered by an emergency backup diesel generator. The elevators would also have centrifugal braking in the drive unit upon power failure;
3. A fire detection system would be designed and erected per code in the Electrical Equipment Module (electrical room), which would also be equipped with a dry powder extinguisher. Detection system alarms would be generated to plant operation systems and personnel, and addressees as agreed with the Fire Marshal. A water-based fire suppression system would not be needed as there are no especially flammable materials or unusual potential ignition sources in the tower and SRSG;
4. No workers would be stationed at the top of the tower during routine operation. However, the area may be accessed on occasion for maintenance (typically electrical or instrumentation work or checks, and occasionally circulation pump maintenance); and
5. A detailed emergency response plan would be created after detailed design of the tower and its internal systems were further developed. (Ex. 2000, p. 4.14-12.)

Condition of Certification **WORKER SAFETY-11** requires the above safety measures to be incorporated into two Tower Access and Safety Plans; one for construction and one for commissioning and operations. The Tower Access and Safety Plans address controlled access to the towers, fire detection and suppression systems, elevator operations, emergency hoist systems, and backup power supply for the elevators and hoists. (Ex. 2000, p. 4.14-13.)

In summary, Condition of Certification **WORKER SAFETY-1** (Project Construction Safety and Health Program), Condition of Certification **WORKER SAFETY-2** (Project Operations and Maintenance Safety and Health Program), and new Condition of Certification **WORKER SAFETY-11** (Tower Access and Safety Plan) would ensure that workers in the solar field and towers have a safe work environment and that they receive and wear the appropriate personal protective equipment, including protective sunglasses. (Ex. 2000, p. 4.14-13.)

During the summer “monsoon season,” sub-tropical weather fronts enter the desert from the south bringing intense storms with extremely heavy rainfall over very short periods of time. These storms are mostly unpredictable and flash floods can result from the dropping of high amounts of water (inches of rain) in a very short time onto the desert floor resulting in high levels of run-off in otherwise dry washes. The force of moving water in a flash flood is often underestimated and workers at a desert solar power plant site may attempt to drive or walk through the swift flows to cross it. The evidence indicates that as little as two feet of water is enough to carry away most passenger

vehicles and swiftly moving water six inches deep can cause a person to lose balance. Although the administration building and both power blocks are outside of the large desert washes, the paved main access road connecting the power blocks and several other internal unpaved roads are located within washes and would be expected to flood during heavy precipitation events. (Ex. 2000, p. 4.14-13.)

To avoid injury or death during a flood event, Conditions of Certification **WORKER SAFETY -1** and **WORKER SAFETY-2** require a Construction Flood Safety Plan and an Operations Flood Safety Plan. These plans establish requirements and provide guidance on avoiding injury or death to on-site workers during a very large flood event (100-year flooding or larger). The plans must be submitted to the Energy Commission for review and approval and include the following:

- Specific actions to be completed during a very large flood event in order to protect workers;
- Identified flood refuge areas that would not be susceptible to 100-year flooding; and
- Requirements that all on-site workers implement the plan and that the plan be updated, as needed during the life of the project. (Ex. 2000, p. 4.14-13.)

### **Additional Mitigation Measures**

The hazards associated with the construction industry are well documented. These hazards increase in complexity in the multi-employer worksites typical of large, complex, industrial-type projects such as the construction of solar power plants. In order to reduce and/or eliminate these hazards, it has become standard industry practice to hire a Construction Safety Supervisor to ensure a safe and healthful environment for all personnel. Audits recently conducted of power plants under construction indicate that the presence of a Construction Safety Supervisor has reduced and/or eliminated hazards on site. The federal Occupational Safety and Health Administration (OSHA) has also entered into strategic alliances with several professional and trade organizations to promote and recognize safety professionals trained as Construction Safety Supervisors, Construction Health and Safety Officers, and other professional designations. The goal of these partnerships is to encourage construction subcontractors in four areas:

- To improve their safety and health performance;
- To assist them in striving for the elimination of the four hazards (falls, electrical, caught in-between, and struck-by hazards), which account for the majority of fatalities and injuries in this industry and have been the focus of targeted OSHA inspections;

- To prevent serious accidents in the construction industry through implementation of enhanced safety and health programs and increased employee training; and
- To recognize those subcontractors with exemplary safety and health programs. (Ex. 2000, p. 4.14-14.)

Condition of Certification **WORKER SAFETY-3** requires the project owner to designate and provide a power plant site Construction Safety Supervisor (CSS) who serves as the "Competent Person" as required by OSHA and Cal/OSHA. Accidents, fires, and a worker death have occurred at Energy Commission-certified power plants in the past due to the failure to recognize and control safety hazards and the inability to adequately supervise compliance with occupational safety and health regulations. Safety problems have been documented by the Energy Commission in safety audits conducted in 2005 at several power plants under construction. The findings of the audit include, but are not limited to, such safety oversights as:

- Lack of posted confined space warning placards/signs;
- Confusing and/or inadequate electrical and machinery lockout/tag-out permitting and procedures;
- Confusing and/or inappropriate procedures for handing over lockout/tag-out and confined space permits from the construction team to commissioning team and then to operations;
- Dangerous placement of hydraulic elevated platforms under each other;
- Inappropriate placement of fire extinguishers near hot work;
- Dangerous placement of numerous power cords in standing water on the site, thus increasing the risk of electrocution;
- Construction of an unsafe aqueous ammonia unloading pad;
- Inappropriate and unsecure placement of above-ground natural gas pipelines inside the facility, but too close to the perimeter fence; and
- Lack of adequate employee- or contractor-written training programs addressing proper procedures to follow in the event of finding suspicious packages or objects either on or off site. (Ex. 2000, p. 4.14-15.)

In order to reduce and/or eliminate these hazards, we find it necessary for the Energy Commission to have a professional Safety Monitor on site to track compliance with Cal/OSHA regulations and periodically audit safety compliance during construction, commissioning, and the transition to operational status. These requirements are outlined in Condition of Certification **WORKER SAFETY-4**. A Safety Monitor, hired by

the project owner, yet reporting to the Chief Building Official (CBO) and CPM, would serve as an “extra set of eyes” to ensure that safety procedures and practices are fully implemented at the power plant site. (Ex. 2000, p. 4.14-16.)

### **Valley Fever (Coccidioidomycosis)**

Coccidioidomycosis or Valley Fever (VF) is primarily encountered in southwestern states, particularly in Arizona and California. It is caused by inhaling the spores of the fungus *Coccidioides immitis*, which are released from the soil during soil disturbance (e.g., during construction activities) or wind erosion. The disease usually affects the lungs and can have potentially severe consequences, especially in at-risk individuals such as the elderly, pregnant women, and people with compromised immune systems. Trenching, excavation, and construction workers are often the most exposed population. Treatment usually includes rest and antifungal medications. No effective vaccine currently exists for VF. VF is endemic to the San Joaquin Valley in California, which presumably gave this disease its common name. In California, the highest VF rates are recorded in Kern, Kings, and Tulare Counties, followed by Fresno and San Luis Obispo Counties. LA County, San Diego County, San Bernardino County, and Riverside County have also reported VF cases, although much fewer. (Ex. 2000, p. 4.14-16.)

Evidence shows that in October 2007, a construction crew excavated a trench for a new water pipe in California. Within three weeks, 10 of 12 crew members developed VF, with 7 of the 10 displaying abnormal chest x-rays. Four crew members had rashes and one had an infection that had spread beyond his lungs and affected his skin. Over the next few months, the 10 ill crew members missed at least 1660 hours of work and 2 workers were on disability for at least 5 months. A February 2013 outbreak of VF affecting at least 28 workers at a photovoltaic solar plant in eastern San Luis Obispo County, along with an increase in inmates at two San Joaquin Valley prisons coming down with the disease, has sparked renewed interest and concern. California does not yet have an official statewide method of tracking the rate of VF infections. Infection rates in California and Arizona have risen 400 percent in the last 10-year reporting period, from an estimated 31 cases for every 100,000 people in 1999 to 157 cases for every 100,000 people in 2011. The number of cases in Kern County alone has more than tripled from 2009 to a total of 2,051 cases in 2010, and 2,734 cases in 2011 (Ex. 2000, p. 4.14-16.)

The Centers for Disease Control and Prevention report that the total number of VF cases nationwide rose by nearly 900 percent from 1998 to 2011. Researchers do not have a good explanation for the dramatic increase even when accounting for growing populations throughout the Southwest, although when soil is dry and it is windy, more spores are likely to become airborne in endemic areas. (Ex. 2000, p. 4.14-17.)

VF is spread through the air. If soil containing the fungus is disturbed by construction, natural disasters, or wind, the fungal spores get into the air where people can breathe in the spores. The disease is not spread from person to person. Occupational or recreational exposure to dust is an important consideration. Agricultural workers, construction workers, or others (such as archeologists) who dig in the soil in the disease-endemic area of the Central Valley are at the highest risk for the disease. The risk for disseminated coccidioidomycosis is much higher among some ethnic groups, particularly African-Americans and Filipinos. In these ethnic groups, the risk for disseminated coccidioidomycosis is tenfold that of the general population (see **Worker Safety and Fire Protection - Table 1**). (Ex. 2000, p. 4.14-20.)

**Worker Safety and Fire Protection - Table 1  
Disease Forms of Valley Fever**

<b>Categories</b>	<b>Notes</b>
Asymptomatic	Occurs in about 50 percent of patients
Acute Symptomatic	<p>Pulmonary syndrome that combines cough, chest pain, shortness of breath, fever, and fatigue.</p> <p>Diffuse pneumonia affects immunosuppressed individuals</p> <p>Skin manifestations include fine papular rash, erythema nodosum, and erythema multiforme</p> <p>Occasional migratory arthralgias and fever</p>
Chronic Pulmonary	<p>Affects between 5 to 10% of infected individuals</p> <p>Usually presents as pulmonary nodules or peripheral thin-walled cavities</p>
<b>Extrapulmonary/Disseminated Varieties</b>	
Chronic skin disease	Keratotic and verrucose ulcers or subcutaneous fluctuant abscesses
Joints / Bones	<p>Severe synovitis and effusion that may affect knees, wrists, feet, ankles, and/or pelvis</p> <p>Lytic lesions commonly affecting the axial skeleton</p>
Meningeal Disease	<p>The most feared complication</p> <p>Presenting with classic meningeal symptoms and signs</p> <p>Hydrocephalus is a frequent complication</p>
Others	May affect virtually any organ, including thyroid, GI tract, adrenal glands, genitourinary tract, pericardium, peritoneum

(Ex. 2000, p. 4.14-21.)

Given the available scientific and medical literature on VF and the recent outbreaks in California, it is clear that the potential for VF to impact workers during construction and operation of the PSEGS is very high. The project owner must saturate the soil prior to and during construction activities and workers must wear dust masks to minimize the

potential exposure to coccidioidomycosis during soil excavation and grading. The dust (PM10) control measures found in the **AIR QUALITY** section of this Decision require diligent compliance to reduce the risk of VF infection to less than significant. Condition of Certification **WORKER SAFETY-8** requires that the dust control measures found in Conditions of Certification **AQ-SC3** and **AQ-SC4** be supplemented with additional requirements, including implementing additional monitoring methods. (Ex. 2000, p. 4.14-21.)

Since incidents of VF have now occurred at another solar PV power plant under construction elsewhere in the state, we find it necessary to track VF incidents to ensure that worker protections are being implemented and are adequate. Therefore, Condition of Certification **WORKER SAFETY-12** requires the project owner to report all verified incidents of VF in all workers at the site to the CPM within 24 hours of receiving notification from a medical professional that the worker has contracted VF. The CPM would maintain a data base of VF occurrences at all desert power plants to assist in determining the adequacy of worker protection. (Ex. 2000, p. 4.14-21.)

### **Fire Hazards**

During construction and operation of the PSEGS project, there is the potential for both small fires and major structural fires. Electrical sparks, combustion of fuel oil, hydraulic fluid, mineral oil, insulating fluid at the power plant switchyard or flammable liquids, explosions, and over-heated equipment, may cause small fires. Major structural fires in areas with automatic fire detection and suppression systems are unlikely to develop at power plants. Compliance with all LORS and providing mitigation to the RCFD would be adequate to assure protection from all fire hazards. (Ex. 2000, p. 4.14-22.)

The PSEGS would rely on both on-site fire protection systems and local fire protection services. The on-site fire protection system provides the first line of defense for small fires. The on-site system for the power blocks and common area are the same regardless of the type of solar generating system used (parabolic trough or tower). In the event of a major fire, fire support services, including trained firefighters and equipment for a sustained response, would be provided by the RCFD.

### **Construction**

During construction, the permanent fire protection systems proposed for the PSEGS would be installed as soon as practical. Until then, portable fire extinguishers would be placed throughout the site at appropriate intervals and periodically maintained. Safety procedures and training would be implemented according to the guidelines of the Construction Fire Protection and Prevention Plan. (Ex. 2000, p. 4.14-22.)

The PSEGS project would construct and operate a concrete batch plant and an above-ground fuel depot on the site during construction. The fuel depot (which may remain in

service during operations) would contain a maximum of 20,000 gallons of diesel fuel and 500 gallons of gasoline. The concrete batch plant would require additional fire detection and suppression systems that would be reviewed and evaluated by the Riverside County Fire Marshall and the Energy Commission CPM. (Ex. 2000, p. 4.14-22.)

The fire protection measures that are required by code for the fuel depot and dispensing facility include:

- Chapter 22 of the 2007 California Fire Code: Motor Fuel-Dispensing Facilities and Repair Garages (formally adopted by Riverside County); and
- NFPA 30a: Code for Motor Fuel Dispensing Facilities and Repair Garages (Ex. 2000, p. 4.14-22).

The requirements listed in applicable sections of the 2007 California Fire Code and NFPA 30a include the materials to be used to construct fuel tanks, location of dispensing devices, spacing from other structures, fencing, physical protective barriers, shut-off valves, emergency relief venting, secondary containment, vapor and liquid detection systems with alarms, and other general design requirements. (Ex. 2000, p. 4.14-23.)

NFPA 30a requires the following:

- 7.3.5 Fixed Fire Protection;
- 7.3.5.1 For an unattended, self-serve, motor fuel dispensing facility, additional fire protection shall be provided where required by the authority having jurisdiction;
- 7.3.5.2 Where required, an automatic fire suppression system shall be installed in accordance with the appropriate NFPA standard, manufacturers' instructions, and the listing requirements of the systems;
- 9.2.5 Basic Fire Control;
- 9.2.5.1 Sources of Ignition. Smoking materials, including matches and lighters, shall not be used within 6m (20 ft) of areas used for fueling, servicing fuel systems...;
- 9.2.5.2 Fire Extinguishers. Each motor fuel dispensing facility or repair garage shall be provided with fire extinguishers installed, inspected, and maintained as required by NFPA 10, *Standard for Portable Fire Extinguishers*. Extinguishers for outside motor fuel dispensing areas shall be provided according to the extra (high) hazard requirements for Class B hazards, except that the maximum travel distance to an 80 B:C extinguisher shall be permitted to be 30.48m (100 feet); and

- 9.2.5.3 Fire Suppression Systems. Where required, automatic fire suppression systems shall be installed in accordance with appropriate NFPA standard, manufacturer's instructions, and the listing requirements of the systems. (Ex. 2000, p. 4.14-23.)

The authority having jurisdiction over the PSEGS is the Energy Commission, but the RCFD would review and comment on the fire detection and suppression plans for the fuel depot before it is built and operated. (Ex. 2000, p. 4.14-23.)

The only fire protection measure expressly listed in the California Fire Code is a requirement for fire extinguishers to be located within 75 feet of the fuel dispensing equipment. Neither the CFC nor the Riverside County codes require sprinkler systems for fuel dispensing facilities. Section 2203.2 of the CFC requires an approved, clearly identified and readily accessible emergency disconnect switch at an approved location to stop the transfer of fuel to the fuel dispensers in the event of a fuel spill or other emergency. Section 2205.3 requires spill control to prevent liquids spilled during dispensing operations from flowing into buildings and section 2206.5 requires that above-ground tanks be provided with secondary containment in the form of drainage control or placement of berms or dikes in accordance with chapter 34. The project owner has proposed to install secondary containment. (Ex. 2000, p. 4.14-23.)

The project owner intends to meet all codes and standards in their operations of the batch plant and fuel depot. Condition of Certification **WORKER SAFETY-1** requires the RCFD to review and the CPM to review and approve the fire protection systems for the fuel depot. (Ex. 2000, p. 4.14-24.)

### **Operation**

The information in the record indicates that the project intends to meet the fire protection and suppression requirements of the 2007 California Fire Code, all applicable recommended NFPA standards (including Standard 850 addressing fire protection at electric generating plants), and all Cal/OSHA requirements, with the exception of providing a secondary access road and gate for emergency response vehicles. The PSEGS has only one access point through the main gate (via a new paved access road from an I-10 interchange. The Petitioner seeks to have the requirement for a second access road found in the PSPP Condition of Certification **WORKER SAFETY-6** removed. Both the California Fire Code (24 CCR part 9, chapter 5, section 503.1.2) and the Uniform Fire Code (sections 901 and 902) require that access to the site be reviewed and approved by the fire department, and the RCFD stated that a second road and gate for fire and emergency responders is required for this site. (Ex. 2000, p. 4.14-24.)

However, there are several site-specific reasons why Staff and Petitioner agree that a second emergency access road is no longer necessary. Instead, they recommend at least two emergency access gates (one each on the north fence line and the south fence line). (Ex. 2000, p. 4.14-24.)

First, the removal of heat transfer fluid (HTF) and propane from the PSEGS project lowers the fire risk significantly. And, although the need for rescue and high-structure fire fighting has been significantly elevated with the proposed towers in the PSEGS project, the need to obtain access from different sides is greatly reduced. Other site-specific issues render the placement of a secondary access road problematical. From a biological perspective, there are several constraints to be considered when siting the secondary access road. Desert tortoise critical habitat occurs north of the I-10 freeway along the southwestern perimeter of the project site. Development within critical habitat is not desired and can be costly given the 5:1 mitigation ratio. Additionally, large vegetated ephemeral washes flow across the area likely to be impacted by a secondary access road. Development within washes disrupts natural processes adversely impacting wildlife and the greater ecosystem by increasing sedimentation, increasing the number of nonnative plants, and destruction of rare microphyll vegetation within and along the washes, which recuperate very slowly under desert conditions. Impacts to desert dry wash woodland are typically mitigated at a 3:1 ratio. For any alignment chosen, thorough and time-consuming surveys of existing biological resource would need to be performed as per the following partial list:

- Jurisdictional delineation (CDFG Code 1600);
- Protocol desert tortoise surveys;
- General wildlife surveys;
- General botanical surveys;
- Rare plant surveys; and
- Burrowing Owl surveys (Ex. 2000, p. 4.14-25).

In order to comply with the requirements of the LORS, we would impose modifications to Condition of Certification **WORKER SAFETY-6** that would require the project owner to provide at least two secondary access gates for emergency vehicles to enter the site from around the perimeter in the event the main access road is blocked, and to ensure that all roads are capable of supporting a 60,000 pound fire engine. There must be at least two access gates equipped with either a keypad or key for fire department and other emergency response personnel to open the gate. The RCFD, the California Highway Patrol, and the Riverside County Sheriff's Department shall be given access to these gates. In the event of an emergency that requires the RCFD to enter the site

through these gates, the RCFD would be able to access the gate by using their two all-terrain fire engines that were purchased for them by the Genesis Solar Energy project. PSEGS is required under Condition of Certification **WORKER SAFETY-6** to contribute to these specialized fire engines by paying one-half the costs and one-half the annual operating/maintenance costs. (Ex. 2000, p. 4.14-25.)

Fire suppression elements in the PSEGS plant include both fixed and portable fire extinguishing systems. The fire water would be supplied from up to 10 on-site wells and stored in 2 - 800,000-gallon water storage tanks (one at each power block) with a dedicated fire protection supply of 600,000 gallons in each power block and 480,000 gallons in a storage tank in the common area. One primary electric and one diesel-fueled backup firewater pump would ensure water supply to each fire protection loop at a maximum flow of 5000 gpm. (Ex. 2000, p. 4.14-25.)

Fire hydrants would be installed throughout the site per NFPA requirements and a sprinkler deluge system would be installed in areas of risk including each unit's transformer. A sprinkler system would be installed at the steam turbine generators in the towers and in administrative buildings. In addition to the fixed fire protection system, appropriate class of service portable extinguishers and fire hydrants/hose stations would be located throughout the facility at code-approved intervals. (Ex. 2000, p. 4.14-26.)

According to NFPA standards and Uniform Fire Code (UFC) requirements, the fire protection system must have fire detection sensors and monitoring equipment that would trigger alarms and automatically activate the suppression systems. These systems would ensure adequate fire protection. (Ex. 2000, p. 4.14-26.)

The project owner is required by Conditions of Certification **WORKER SAFETY-1** and **-2** to provide the final Fire Protection and Prevention Program to the CPM and to the RCFD prior to construction and operation of the project to confirm the adequacy of the proposed fire protection measures. (Ex. 2000, p. 4.14-26.)

### **Mitigation of Impacts to RCFD**

The only issue in contention regarding fire protection at the PSEGS solar power plant is the level of mitigation required to reduce impacts to the RCFD to a level below significance. As indicated in the PSPP Final Decision, the Energy Commission has expressed a preference that the parties and the relevant fire departments negotiate reasonable monetary mitigation on their own without Energy Commission involvement. The petitioner, RCFD, and Staff explained their respective positions in testimony and, despite several efforts, the parties could not come to an agreement. (Exs. 2000, p. 4.14-26; 1012, p. 4; 1019, pp. 1-2; 1041, p.17; 1059, p.2; 10/29/13 RT 232:10 – 263:4.)

The PSEGS facility is located in an area that is currently served by the RCFD. The fire, HazMat, rescue, inspection, and EMS needs at the PSEGS plant potentially pose significant demands on local fire protection services. RCFD would be able to respond to fire, HazMat, and EMS emergencies in a timely manner at the PSEGS, but not to high-angle technical rescue emergencies. Staff testified that the PSEGS would cause a significant direct impact on the local fire department, but would not cause a significant cumulative impact. According to Staff, a direct impact is caused by the need to equip and train the fire department to respond to the specific unique hazards posed by solar tower technology, which would be new to the county. Staff argues that no significant cumulative impact would occur because the construction and operation of the PSEGS plant is not likely to change the overall hazard profile of facilities requiring emergency response in the county, so emergency events at the PSEGS facility are not likely to escalate beyond the power plant site, and emergencies are not likely to occur simultaneously with other facilities. (Ex. 2000, pp. 4.14-26; 4.14-28.)

Petitioner and Staff have reached agreement on all conditions of certification for **WORKER SAFETY** and Fire Protection except Condition of Certification **WORKER SAFETY-7**. Condition of Certification **WORKER SAFETY-7**, as proposed by Staff with RCFD's concurrence, would require the project owner to fund \$1,000,000.00 for RCFD capital costs and provide the RCFD an annual payment of \$313,000.00 for operations and maintenance, including staffing. The annual payment would be subject to an annual "escalator" equal to the U.S. Bureau of Labor Statistics' Consumer Price Index for the previous calendar year, recalculated annually until the closure of the power plant. (Ex. 2000, p. 4.14-26; 10/29/13 RT 240:3 - 6; 248:25 – 252:14.)

The Petitioner counters that the construction and operation of the PSEGS would have a cumulative impact on the RCFD, but believes that Staff's mitigation amount is too large and overly burdens the PSEGS project to the benefit of other Riverside County solar projects currently in development or under construction. (Ex. 1077, p. 67.) The Petitioner proposes to fund \$1,200,000.00 in RCFD capital costs and provide funding for operations and maintenance, including staffing, in an annual payment of \$684,000.00 for the first three years; however, in the fourth year, the staffing funding would reduce down to \$85,500.00 annually. The \$684,000.00 total sum for the first three years would fund RCFD staffing during PSEGS' construction phase, but the Petitioner seeks to pay the reduced annual amount of \$85,500.00, which represents one-eighth of the ongoing costs to account for the contribution of "the 7 other approved projects even though there are more projects that would contribute in accordance with Policy B-29." (Ex. 1077, pp. 70 - 71.)

Riverside County's Policy B-29 (<http://www.rivcocob.org/solar-power-plant-policy/>) imposes, *inter alia*, a \$150.00 per acre charge for solar power plants built within its

jurisdiction. (County of Riverside Comments on the Final Staff Assessment, docketed October 29, 2013, p. 5.) According to comments submitted by Tiffany North, Supervising Deputy County Counsel for Riverside County, Policy B-29 does not “substitute for development impact fees or Fire Department capital costs.” (County of Riverside Comments on the Final Staff Assessment, docketed October 29, 2013, p. 6.) Riverside County has expressly prohibited Policy B-29 funds from mitigating “project-specific impacts” including mitigation that would be required under CEQA. (County of Riverside Comments on the Final Staff Assessment, docketed October 29, 2013, p. 7.)

In the **LAND USE** section of this Decision, we found that since the PSEGS project is sited entirely on BLM land, the project is subject only to federal jurisdiction and exempt from Riverside County jurisdiction. Therefore, the project is not obligated to pay the annual solar power plant fee of approximately \$569,100.00 (\$150.00 x 3,794 acres). We accept Staff’s conclusion that the PSEGS would not result in cumulative considerable impacts to the RCFD and, therefore, confine our calculation of mitigation to the direct impacts the PSEGS project would have on RCFD’s resources. (Ex. 2000, p. 4.14-26.) In light of the uncertainty in the record about the actual revenues that would be received by RCFD from other solar projects’ Policy B-29 payments, we do not find Policy B-29 useful in calculating a reasonable offset to PSEGS’ direct impacts to RCFD.

We make the following observations. First, we acknowledge that the very nature of calculating the cost of a project’s projected utilization of RCFD’s fire protection and rescue services is speculative. Nevertheless, we agree with Staff that “fire departments must plan for the possible, not the probable.” (Ex. 2000, p. 4.14-31; 10/29/13 RT 238:20 – 239:13.) Staff asserts that the PSEGS would require RCFD to provide services and encumber significant time and funds in six areas:

1. Familiarization with and planning for emergency responses to a facility using a solar energy technology new to Riverside County;
2. Plan reviews and inspections;
3. Fire response;
4. HazMat spill response;
5. Rescue; and
6. Emergency Medical Services (EMS). (Ex. 2000, p. 4.14-27.)

The explanation of these needs is reasonable. RCFD testified that for technical rescues including confined space, trench rescue, high angle rescues, the Riverside County standard response plan would involve a battalion chief, three fire engines, a squad if available, an ambulance, a truck company, and a HazMat unit; normal response is 21 persons. The truck company would respond with four persons that are highly trained in

these rescues supported by multiple engine companies. The Blythe station normally staffs nine persons. The Desert Center station staffs three. (10/29/13 RT 237:3 – 237:6.)

RCFD must adhere to standard operating procedures and Cal/OSHA regulations that require “two in, two out.” Thus, a response of three fire fighters from one station would not allow fire fighters to attack a fire from within a structure or conduct a rescue. Confined space and collapsed trench rescues would also be problematic with only three fire fighters. Therefore, no matter what size the fire or how many workers are initially in need of rescue, the RCFD would dispatch engines from at least three fire stations so that at a minimum, nine firefighters are sent to the scene, but the RCFD could eventually dispatch a total of nine engines. (Ex. 2000, p. 4.14-28.)

The record describes how the extreme desert heat impacts fire and rescue personnel. The ability of a firefighter to perform duties while wearing a turn-out coat, heavy boots, and a respirator is limited under the best of circumstances. If conducting a rescue or fighting a fire that necessitates use of a respirator, the high-temperatures of the desert, which often exceed 115°F, severely limit a firefighter’s ability to perform the duties to 15 minutes at a time. This severe time restriction necessitates the mobilization of more firefighters to respond to the emergency. RCFD must frequently rotate fire personnel to cool them down, reduce their blood pressure and rehydrate them. The desert environment requires an increased labor force for rescue and fire response. (10/29/13 RT 238:7 – 17.)

Petitioner agrees with Staff and RCFD regarding the planning and resources needed to respond to the power plants, so the bases for the costs are not in issue. (10/29/13 RT 232:12 – 16; 246:18-20; 247:9-12.) While Staff recommends a one-time payment of \$1 million for equipment costs, Petitioner offers \$1.2 million, which is not a major difference. (10/29/13 RT 232:17 – 18; 249:23 - 250:1.) The dispute is limited to the costs of operations and maintenance (O&M) costs, including staffing. (10/29/13 RT 249:21 - 250:11.)

Energy Commission Staff recommends an annual payment of \$313,000.00 for O&M for the remaining lifetime of the power plant as mitigation for direct impacts. Staff also recommends a cost-of-living escalator, which is reflected in Staff’s proposed Condition of Certification **WORKER SAFETY-7**. Staff proposes that the Consumer Price Index for the previous calendar year as published by the U.S Bureau of Labor Statistics be used as the annual escalator to account for inflation. (Ex. 2000, p. 4.14-38.)

Petitioner points out that neither RCFD nor Staff conducted any assessment of exactly what infrastructure or level of support the PSEGS project would trigger, nor what the costs would be to mitigate the PSEGS project. (Ex. 1077, p.67; 10/29/13 RT 242:6-10.)

On the other hand, Petitioner's Fire and Emergency Services Risk Assessment contained very specific data that outlined the number and types of calls handled by the three closest fire stations for the last few years. (Exs. 1051, pp. 7-1 - 7-5.)

Specifically, Petitioner's expert testified that based on a "reasonable standard" for an engine company workload of 6.5 calls per day (or 2,190 calls on an annual basis) as defined in the *Riverside County Fire Department Strategic Plan 2009-2029*, the three fire stations closest to the PSPGS site have the capability of responding to a total of 6,570 calls per year. The total of 665 annual calls between the three stations in 2012 represents 10 percent of the maximum workload capacity for these three stations. Additionally, the total number of calls between the three stations in 2012 was down 75 calls from 2011, or a reduction in calls of nine percent. Further, during the years 2011 and 2012, the Genesis Solar Energy project, the Desert Sunlight project, and the SCE Red Bluff Substation were all under construction and, therefore, it does not appear that the cumulative construction of these projects resulted in any additional drawdown of RCFD resources at these three stations. Thus, based on workload capacity alone, the Petitioner argues that the addition of the PSEGS facility to their service area would not justify the addition of an engine company, a fire station, or any additional staff. (Exs. 1051, p. 7-5; 1077, p. 68.)

Petitioner's expert testified that Staff failed to account for the additional financial support that projects outside of the Energy Commission's jurisdiction would contribute to Riverside County, which should specifically be applied to RCFD. While Staff correctly stated in the FSA that there are few requests for service for both EMS and fire response to solar power plants in Riverside County, and that there is little impact on their overall operation, Staff still concluded that it was proper to allocate all of the regional costs across four Commission projects. Petitioner claims that a more accurate and fair approach would be to determine:

1. The correct amount that should be allocated to the PSEGS in relation to the other funding recourses Riverside County has available to it; and
2. The contribution that should be provided by all projects that would benefit from the RCFD increased infrastructure, and to the very low impacts on the RCFD when the existing unused capacity of the existing fire stations is considered. (Ex. 1077, p. 69.)

While we accept the idea that PSEGS should not shoulder the burden for all the numerous solar projects within the RCFD's jurisdiction, we do insist that PSEGS' actual direct impacts be mitigated. The evidence shows that the impacts peculiar to the PSEGS project derive from the solar tower itself and, as a result, RCFD must provide training, equipment, and expend resources for technical rescues including confined

space, trench rescue, and high angle rescues. The only other project with these service requirements in the RCFD service area is the Rice Solar Energy Project (RSEP). Therefore, applying the Petitioner's approach to calculate the O&M costs, the evidence compels us to divide the funding burden between the PSEGS and RSEP, that is, by one-half rather than one-eighth, because the other projects would not require high-angle technical rescues. Assuming that the staffing costs calculated by Petitioner's expert are accurate (and we have no evidence to the contrary), we find that it is fair to divide the total annual staffing costs of \$684,000.00 by 2, which leaves a quotient of \$342,000.00. We find that this is a fair contribution that would mitigate PSEGS' direct impacts to the RCFD below significance. We would not impose the escalator recommended by Staff. Therefore, we have modified Staff's recommended Condition of Certification **WORKER SAFETY-7**, to require the project owner to fund \$1,200,000.00 for RCFD capital costs, and provide the RCFD an annual payment of \$342,000.00 for operations and maintenance, including staffing. We find that Condition of Certification **WORKER SAFETY-7** mitigates all project impacts to RCFD to below significance.

According to the Staff, there have been few problems at other solar and gas-fired power plants where questions about fire department plan review and inspections have been raised. Staff believes that it is necessary to clearly define the duty of the project owner to work with the local fire department in the review of fire detection and suppression systems. In the absence of contrary evidence, we adopt Condition of Certification **WORKER SAFETY-10**, which requires the project owner to submit to the RCFD all plans and schematic diagrams that show the details of all fire detection and suppression systems and pay the RCFD its usual and customary fee for the review of those plans, and for inspections to ensure compliance with those plans. The project owner would then be required to provide proof to the CPM that the plans have been submitted to the RCFD on a timely basis, along with a copy of the comments received from the RCFD, and proof that the usual and customary payments for plan review have been made to the fire department. (Ex. 2000, p. 4.14-38.)

### **Emergency Medical Services Response**

Evidence indicates that incidents at gas-fired power plants that require EMS response are infrequent and represent an insignificant impact on the local fire departments, except for instances where response times are high or a rural fire department has mostly volunteer fire-fighting staff. However, the potential for both work-related and non-work-related heart attacks exists at power plants. In fact, many of the responses for cardiac emergencies involved non-work-related incidences and power plant visitors. The need for a prompt response within a few minutes is well documented in the medical literature. Staff asserts that the quickest medical intervention can only be achieved with the use of an on-site automatic external defibrillator (AED), because the response from

an off-site provider would take longer regardless of the provider location. This is well documented and serves as the basis for many private and public locations (e.g., airports, factories, government buildings) maintaining on-site cardiac defibrillation devices. Therefore, we conclude that with the advent of modern cost-effective cardiac defibrillation devices, it is proper in a power plant environment to maintain such a device and have trained staff on site in order to treat cardiac arrhythmias resulting from industrial accidents or other non-work related causes. (Ex. 2000, pp. 4.14-38 – 4.14-39.)

Condition of Certification **WORKER SAFETY-5** requires that a portable AED be located on site, that all power plant employees on site during operations be trained in its use, and that a representative number of workers on site during construction and commissioning also be trained in its use. Comments from the RCFD include the suggestion that Condition of Certification **WORKER SAFETY-5** also include a requirement that workers on site be trained in basic first aid, and that basic first aid kits be available on site. We agree with these suggestions and modify this condition to include these requirements. (Ex. 2000, p. 4.14-39.)

Also, in response to the concern of the Riverside County Airport Land Use Commission about the safety of medevac helicopters flying into or landing in an area where a thermal plume would exist, Conditions of Certification **WORKER SAFETY-1** and **WORKER SAFETY-2** include a requirement that the project owner submit an Emergency Medical Evacuation Plan as part of the Emergency Response Plan; one for the construction period and another for operations. Emergency medical helicopters would not land within the heliostat fields due to space constraints. Instead, emergency medical helicopters would likely land at the perimeter of the facility, or in the common area. Therefore, no helicopters would be at risk from a thermal plume at the site. The requirement that an Emergency Medical Evacuation plan be prepared and submitted to the CPM for review and approval ensures that the helicopters would not be put at risk. (Ex. 2000, p. 4.14-39.)

### **Non-Operation and Facility Closure Impacts and Mitigation**

Closure of the PSEGS (temporary or permanent) would follow a facility closure plan prepared by the project owner and designed to minimize public health and environmental impacts. Non-operation and facility closure procedures would be consistent with all applicable LORS. Evidence shows that impacts from non-operation and facility closure processes would represent a fraction of the impacts associated with the construction or operation of the PSEGS. Therefore, based on analysis for the construction and operation phases of this project, we find that worker safety and fire protection-related impacts from non-operation and closure of the PSEGS would be insignificant. (Ex. 2000, p. 4.14-39.)

## **Red Bluff Substation**

The SCE Red Bluff Substation is expected to be operational in December 2013. There would not be any overlap of the construction phase of the SCE Red Bluff Substation and the PSEGS. Therefore, we find that there would be no impacts arising from the construction of the SCE Red Bluff Substation. (Ex. 2000, p. 4.14-40.)

## **CUMULATIVE IMPACTS**

The **PROJECT DESCRIPTION** section of this Decision provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis for the PSEGS project. In summary, these projects are placed into three categories:

- Existing energy projects on BLM, state, and private lands: 12 projects are identified in the **PROJECT DESCRIPTION - Table 2**;
- Foreseeable future energy projects in the immediate area and in the desert region: 139 foreseeable projects are identified in the **PROJECT DESCRIPTION - Table 3**;
- Past and present non-energy projects on BLM, state, and private lands: eight projects are identified in the **PROJECT DESCRIPTION – Table 4** (Ex. 2000, p. 4.14-40); and
- All of the above projects are defined within a geographic area that has been identified as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects have, are, or would be required to undergo their own independent environmental review under CEQA. Even if the cumulative projects described in the **PROJECT DESCRIPTION** have not yet completed the required environmental review processes, they were considered in the cumulative impacts analyses in this section. (Ex. 2000, p. 4.14-40.)

## **Effects of Past and Present Projects**

All of these projects or developments in the area or region have or would need the plan review and emergency response services of the RCFD. When combined with the proposed PSEGS, all the listed projects would not have a cumulative impact on the region. The need for rescue, fire, hazardous materials, and EMS response is frequent, yet not concentrated in this county because the distances between the projects are very great. Area power plants that are operating, under construction, or proposed have had any direct fire protection impacts mitigated to a level of less than significant. (Ex. 2000, p. 4.14-40.)

A significant cumulative fire protection impact is defined as the simultaneous emergency at multiple locations that would require the concurrent response for rescue, fire fighting, hazardous materials spill control, and/or EMS response. Existing locations that would likely need emergency response, or locations where such facilities might likely be built, were both considered. While cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control the work environment, spills, and fires. The chances of one event requiring a concerted response from the RCFD is high because accidents do happen at industrial sites. However, the chance of two or more incidents occurring simultaneously with resulting draw-down of fire department resources to the point of endangering other communities with lack of fire department coverage are real, but not as great. The risk of draw-down due to an event at the proposed PSEGS is less than significant, and thus the mitigation contained in revised Condition of Certification **WORKER SAFETY-7** addresses a direct individual impact and reduces it to a less-than-significant impact. (Ex. 2000, p. 4.14-41.)

The project owner would develop and implement a fire protection program for the PSEGS independent of any other projects considered for potential cumulative impacts. We find that the facility, as proposed by the project owner with the additional mitigation measures contained in the conditions of certification, does not pose a cumulatively considerable risk. (Ex. 2000, p. 4.14-41.)

### **Contribution of the Palen Solar Electric Generating System to Cumulative Impacts**

The construction of PSEGS is not expected to result in short-term adverse impacts related to fire protection during construction activities. We understand that some of the cumulative projects described above, which are not yet built, may be under construction at the same time as the PSEGS, however, short term impacts related to fire protection during construction of those cumulative projects are not cumulatively considerable. (Ex. 2000, p. 4.14-41.)

The operation of the PSEGS is expected to result in long-term adverse impacts related to fire protection, but mitigation in Condition of Certification **WORKER SAFETY-7** reduces the impacts to below a significant level. (Ex. 2000, p. 4.14-41.)

The non-operation and facility closure of the PSEGS is not expected to result in adverse impacts related to fire protection similar to construction impacts. It is unlikely that the construction or facility closure of any of the cumulative projects would occur concurrently with the facility closure of this project because the facility closure is not expected to occur for approximately 30 years. As a result, we find that significant impacts related to fire protection during facility closure of the PSEGS generated by the cumulative projects would not be cumulatively considerable. (Ex. 2000, p. 4.14-41.)

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)**

The relevant LORS are contained in **Appendix A** of this Decision. Construction and operation of the PSEGS project with the mitigation below would comply with all applicable laws regarding long-term and short-term project impacts in the area of worker safety and fire protection.

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project would be beneficial to the public, Petitioner, or intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

The use of the power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the parabolic technology. This effectively eliminates the type of EMS calls associated with the handling of Therminol. Furthermore, solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the worker safety posed by the potential for fire and explosion.

## **PUBLIC COMMENT**

On October 29, 2013, the Energy Commission received comments from **Tiffany North**, Supervising Deputy County Counsel for Riverside County. The comments acknowledged that the Final Staff Assessment (Exhibit 2000) addressed most of the county's concerns regarding worker safety and fire protection contained in comments filed on July 30, 2013. The only remaining issues raised in the October 30, 2013 comments addressed Condition of Certification **WORKER SAFETY-7** and facility closure. Specifically, the comments explained some of the funding structure for RCFD, including Policy B-29, and offered rebuttal argument to the testimony of Petitioner's worker safety and fire protection expert. As noted above, these comments were addressed and considered in the "Mitigation of Impacts to RCFD" section above. As to the county's comments on the facility closure, we have found that worker safety and fire

protection related impacts from non-operation and closure of the PSEGS would be insignificant. Therefore, no further mitigation is necessary.

On December 4, 2013, the Energy Commission received a second set of comments from **Tiffany North**, Supervising Deputy County Counsel for Riverside County. The letter indicated continued support for the Commission staff's version of Condition of Certification **WORKER SAFETY-7**. The letter also requested that mitigation condition of certification for impacts to Riverside County Fire Department (RCFD) needs to account for the current number of permitted solar energy projects in the county, not the more extensive list of proposed projects. Using the larger number would improperly lower the amount of funding available to redress cumulative impacts from the projects. In addition, the County refuted the contention that RCFD Battalion 8 serving the desert area was underutilized. Instead, Battalion 8 staff has to travel much longer distances to reach emergency sites and is called to 40 percent more traffic accidents/medical emergencies than the RCFD urban area battalions. Finally, the County contended that it was inappropriate to utilize the approach taken with the RSEP project, because that project was approved in 2010 while solar thermal was still a very new, rushed phenomenon. More recent review by County staff of both RSEP and PSPP has concluded that the impacts to RCFD were inadequately mitigated. These concerns are all addressed above, in the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. Industrial workers at the project site and along the linear corridors would be exposed to potential safety and health hazards on a daily basis.
2. To protect workers from job-related injuries and illnesses, the project owner would implement comprehensive Safety and Health Programs for both the construction and the operation phases of the project.
3. The Safety and Health Programs would include a Worker Heat Stress Protection Plan to address working conditions in the extreme desert heat.
4. The Safety and Health Programs would include personnel protective equipment to protect workers from exposure to glint and glare.
5. The Safety and Health Programs would include enhanced dust control and prevention measures to protect workers from exposure to Valley Fever.
6. The Safety and Health Programs would include measures to protect workers from exposure to unexploded ordnance and other munitions remnants that could be encountered at the site.

7. The project would employ an on-site professional Safety Monitor during construction and operation.
8. Workers trained to use on-site automatic external defibrillators would mitigate the risk of heart attacks on the jobsite.
9. The Emergency Medical Evacuation Plan ensures safe helicopter evacuations.
10. The project would include on-site fire protection and suppression systems as the first line of defense in the event of a fire.
11. The RCFD would provide fire protection and emergency response services to the project.
12. A second emergency access road would cause more harm than good.
13. The PSEGS would install two secondary emergency-access gates.
14. To ensure that fire and emergency service resources are adequate to meet project needs, Condition of Certification **WORKER SAFETY-7** requires the project owner to pay a one-time \$1.2 million fee for the capital costs to purchase necessary equipment and an annual \$342,000.00 payment to RCFD for operations and maintenance costs including staffing.
15. The mitigation fees in Condition of Certification **WORKER SAFETY-7** mitigate the PSEGS' direct impacts, as well as its contribution to potential cumulative impacts on the RCFD's resources.
16. Worker safety and fire protection-related impacts from non-operation and closure of the PSEGS would be insignificant.
17. With the implementation of the conditions of certification below, the PSEGS would have no cumulatively considerable impacts on worker safety and fire protection.
18. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. With implementation of the conditions of certification listed below and the mitigation measures described in the evidentiary record, the PSEGS project would not result in significant health and safety impacts to on-site workers.
2. The mitigated PSEGS project, as described in the evidentiary record, would comply with all applicable LORS listed for worker safety and fire protection as set forth in the appropriate portion of Appendix A of this Decision.

3. The change in the project would be beneficial to the public, Petitioner, and intervenor by the PSEGS site being designated “Developable” in BLM’s Eastern Riverside County Solar Energy Zone. The use of the power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the parabolic technology. This effectively eliminates the type of EMS calls associated with the handling of Therminol. Furthermore, solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to worker safety posed by the potential for fire and explosion.
4. There has been a substantial change in circumstances since the original approval justifying the change, in that the change in technology could not have been anticipated during the original permitting process because at the time of the original licensing the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission’s Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

**WORKER SAFETY-1** The project owner shall submit to the Compliance Project Manager (CPM) a copy of the Project Construction Safety and Health Program, which complies with all applicable federal and state LORS for Worker Safety and Health and includes the following:

- A Construction Personal Protective Equipment Program (including compliance with ANSI Standard Z87.1-2010 for protective eye wear);
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program including measures to prevent exposure to Valley Fever;
- A Construction heat stress protection plan that implements and expands on existing Cal-OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan (including an Emergency Medical Evacuation Plan for the period of construction);
- A Construction Flood Safety Plan; and
- A Construction Fire Prevention Plan that includes the concrete batch plant and the above-ground fuel depot.

The Personal Protective Equipment Program, the Exposure Monitoring Program, the Heat Stress Protection Plan, and the Injury and Illness Prevention Program shall be submitted to the CPM for review and approval concerning compliance of the program with all applicable safety

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orders. The Construction Emergency Action Plan and the Fire Prevention Plan shall be submitted to the RCFD for review and comment prior to submittal to the CPM for approval.

**VERIFICATION:** At least 30 days prior to the start of construction, the project owner shall submit to the CPM, for review and approval, a copy of the Project Construction Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the RCFD stating the fire department's comments on the Construction Fire Prevention Plan and Emergency Action Plan.

**WORKER SAFETY-2** The project owner shall submit to the CPM a copy of the Project Operations and Maintenance Safety and Health Program that complies with all applicable federal and state LORS related to Worker Safety and Health and include the following:

- An Operation Injury and Illness Prevention Plan including measures to prevent exposure to VF;
- An Operation heat stress protection plan that implements and expands on existing Cal OSHA regulations (8 CCR 3395);
- An Emergency Action Plan (including an Emergency Medical Evacuation Plan for operations);
- A Hazardous Materials Management Program;
- A Fire Prevention Plan that includes the fuel depot should the project owner elect to maintain and operate the fuel depot during operations (8 Cal Code Regs., § 3221) as well as the fire protection measures described in this Decision and any necessary upgrades required by current applicable LORS;
- An Operations Flood Safety Plan; and
- A Personal Protective Equipment Program (8 Cal. Code Regs., §§ 3401-3411) that also includes compliance with ANSI Standard Z87.1-2010 for protective eye wear.

The Operation Injury and Illness Prevention Plan, Emergency Action Plan, Heat Stress Protection Plan, and Personal Protective Equipment Program shall be submitted to the CPM for review and comment concerning compliance of the programs with all applicable safety orders. The Fire Prevention Plan and the Emergency Action Plan shall also be submitted to the RCFD for review and comment.

**VERIFICATION:** At least 30 days prior to the start of first-fire or commissioning, the project owner shall submit to the CPM for approval a copy of the Project Operations and Maintenance Safety and Health Program. The project owner shall provide a copy of a letter to the CPM from the RCFD stating the fire department's comments on the Operations Fire Prevention Plan and Emergency Action Plan.

**WORKER SAFETY-3** The project owner shall provide a site Construction Safety Supervisor (CSS) who by way of training and/or experience is knowledgeable of power plant construction activities and relevant LORS, is capable of identifying workplace hazards relating to the construction activities, and has authority to take appropriate action to assure compliance and mitigate hazards. The CSS shall:

- Have overall authority for coordination and implementation of all occupational safety and health practices, policies, and programs;
- Assure that the safety program for the project complies with Cal/OSHA and federal regulations related to power plant projects;
- Assure that all construction and commissioning workers and supervisors receive adequate safety training;
- Complete accident and safety-related incident investigations and emergency response reports for injuries;
- Inform the CPM of safety related Incidents; and
- Assure that all the plans identified in Conditions of Certification **WORKER SAFETY- 1** and **- 2** are implemented.

**VERIFICATION:** At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM the name and contact information for the CSS. The contact information of any replacement CSS shall be submitted to the CPM within 1 business day. The CSS shall submit in the Monthly Compliance Report a monthly safety inspection report to include:

- A. A record of all employees trained for that month (all records shall be kept on site for the duration of the project);
- B. A summary report of safety management actions and safety-related incidents that occurred during the month;
- C. A report of any continuing or unresolved situations and incidents that may pose danger to life or health; and
- D. A report of accidents and injuries that occurred during the month.

**WORKER SAFETY-4** The project owner shall make payments to the Chief Building Official (CBO) for the services of a Safety Monitor based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. Those services shall be in addition to other work performed by the CBO. The Safety Monitor shall be selected by and report directly to the CBO and would be responsible for verifying that the CSS, as required in Condition of Certification **WORKER SAFETY-3**, implements all appropriate Cal/OSHA and Energy Commission safety requirements. The Safety Monitor shall conduct on-site (including linear facilities) safety inspections at intervals necessary to fulfill those responsibilities.

**VERIFICATION:** At least 30 days prior to the start of construction, the project owner shall provide proof of its agreement to fund the Safety Monitor services to the CPM for review and approval.

**WORKER SAFETY-5** The project owner shall ensure that portable automatic external defibrillators (AEDs) and Trauma/First-Aid kits sufficient to handle anticipated industrial accidents are located on site during construction and operations, shall implement a program to ensure that workers are properly trained in AED use and basic first aid (which includes CPR), and shall ensure that the equipment is properly maintained and functioning at all times. During construction and commissioning, the following persons shall be trained in its AED use and basic first aid (which includes CPR), and at least one of the following supervisors shall be on site whenever the workers that they supervise are on site: the Construction Project Manager or delegate; the Construction Safety Supervisor or delegate; and shift foremen. During operations, all power plant employees shall be trained in AED use and basic first aid (which includes CPR). A plan for locating AEDs and first aid kits and the training program shall be submitted to the CPM for review and approval.

**VERIFICATION:** Within 14 days after the start of site mobilization, the project owner shall submit to the CPM proof that portable automatic external defibrillators (AEDs) and trauma/first aid kits exist on site. At least 60 days prior to the start of site mobilization, the project owner shall provide a plan for locating AEDs and first aid kits and a copy of the training and maintenance program for review and approval.

**WORKER SAFETY-6** The project owner shall:

- A. Provide not less than two secondary site access gates for emergency personnel to enter the site, one on the north side of the site and the other on the south side of the site. These secondary

site access gates shall be located at least one-half mile from the main gate and shall be equipped with locks that can be opened by emergency response personnel including the RCFD, the Riverside County Sheriff's Department, and the California Highway Patrol.

- B. In lieu of providing a second access road that provides entry to the site, the project owner shall share the financial responsibility for the costs of obtaining and maintaining two all-terrain fire engines for the RCFD and shall initially pay to the Genesis Solar Energy Project owner an amount equal to 50 percent of the costs of the engines plus, annually, 50 percent of the annual maintenance.
- C. Maintain the main access road and provide a plan for construction and implementation and ensure that the main access road and all internal site roads (paved or dirt) are capable of supporting a fire engine with a weight of 60,000 pounds.

Plans for the secondary access gates, the method of gate operation, and maintenance of the roads shall be submitted to the RCFD for review and comment, and to the CPM for review and approval.

**VERIFICATION:** At least 60 days prior to the start of site mobilization, the project owner shall submit to the RCFD and the CPM preliminary plans showing the locations of at least two secondary site access gates to the site, a description of how the secondary site access gates would be opened by the fire department and other emergency services, and a description and map showing the location, dimensions and composition of the main road.

At least 30 days prior to the start of site mobilization, the project owner shall submit the secondary site access gates final plans and the road maintenance plan to the CPM for review and approval. The final plan submittal shall also include a letter containing comments from the RCFD, or a statement that no comments were received.

At least 30 days prior to the start of site mobilization, the project owner shall submit to the CPM proof of payment for one-half of the cost of the two all-terrain fire trucks to the Genesis Solar Energy project owner. In the project owner's Annual Report, the project owner shall provide proof that it has paid to the Genesis Solar Energy project owner its share of the annual maintenance costs of the 2 all-terrain fire trucks.

**WORKER SAFETY-7** The project owner shall fund its share of the capital costs in the amount of \$1,200,000.00 and shall provide an annual payment of \$342,000.00 to the RCFD for the support of three fire department staff

commencing with the date of site mobilization and continuing annually thereafter.

**VERIFICATION:** At least 30 days prior to the start of site mobilization, the project owner shall provide proof to the CPM, for review and approval of documentation that a letter of credit in the amount of \$1,200,000.00 has been paid to the RCFD for capital costs.

The project owner's Annual Report to the CPM must include documentation that the annual payment of \$342,000.00 has been paid to the RCFD on the first day of site mobilization and each year after that.

**WORKER SAFETY-8** The project owner shall develop and implement an enhanced Dust Control Plan that includes the requirements described in Conditions of Certification **AQSC3** and **AQ-SC4**, and additionally requires:

- A. Site worker use of dust masks (NIOSH N-95 or better) whenever visible dust is present;
- B. No downwind PM10 ambient concentrations to increase more than 50 micrograms per cubic meter above upwind concentrations as determined by simultaneous upwind and downwind sampling. High-volume particulate matter samplers or other EPA-approved equivalent method(s) for PM10 monitoring shall be used. Samplers shall be:
  - 1. Operated, maintained, and calibrated in accordance with 40 C.F.R. part 50, app. J, or appropriate EPA published documents for EPA-approved equivalent methods(s) for PM10 sampling;
  - 2. Reasonably placed upwind and downwind of the large operation based on prevailing wind direction and as close to the property line as feasible, such that other sources of fugitive dust between the sampler and the property line are minimized; and
  - 3. Operated during active operations.
- C. Implementation of enhanced dust control methods (increased frequency of watering, use of dust suppression chemicals, etc. consistent with AQ-SC4) immediately whenever visible dust persists in the breathing zone of the workers, or when PM10 measurements obtained when implementing B (above) indicate an increase in PM10 concentrations due to project activities of 50 µg/m<sup>3</sup> or more.

**VERIFICATION:** At least 30 days prior to the commencement of site mobilization, the enhanced Dust Control Plan shall be provided to the CPM for review and approval.

**WORKER SAFETY-9** The project owner shall participate in annual joint training exercises with the RCFD. The project owner shall coordinate this training with other Energy Commission licensed solar power plants within Riverside County such that this project shall host the annual training on a rotating yearly basis with the other solar power plants.

**VERIFICATION:** At least 10 days prior to the start of commissioning, the project owner shall submit to the CPM proof that a joint training program with the RCFD is established. In each January Monthly Compliance Report during construction and the Annual Compliance Report during operation, the project owner shall include the date, a list of participants, training protocol, and the location of the annual joint training.

**WORKER SAFETY-10** The project owner shall submit to the RCFD all plans and schematic diagrams that show the details of all fire detection and suppression systems, and shall pay the RCFD its usual and customary fee for the review of those plans and for site inspections after construction, but before operations begin. The project owner shall provide proof to the CPM that the plans have been submitted to the RCFD on a timely basis, along with a copy of the comments received from the RCFD after plan review and after site inspections.

**VERIFICATION:** In each Monthly Compliance Report, during construction the project owner shall include any and all comments received from the RCFD on fire detection and suppression systems and proof that the required plan review and inspection fees have been paid to the fire department. During operation, the project owner shall provide proof in the Annual Compliance Report that the required inspection fees have been paid to the fire department.

**WORKER SAFETY-11** The project owner shall prepare and implement a Tower Access and Safety Plan for the construction phase and one for operations (which includes commissioning). These plans shall include descriptions of the following:

1. The type of elevators (cage, enclosed, man-lift, etc.) and emergency hoist systems, their capacity in number of people and pounds, the dimensions of the elevator cage or enclosed structure, and a diagram of the emergency hoist systems;
2. The primary and secondary (emergency) power supply to the elevator hoist systems and how emergency backup power would be triggered;

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3. The emergency elevator recall system (manual on-site activation, remote from the control room, wired or wireless);
4. The fire detection and suppression systems (fixed and portable) within the towers and in the room at the top of tower behind the boiler;
5. Any planned ventilation systems for inside the towers;
6. The maximum number of workers allowed in each tower at any one time or allowed in the room at the top of each of the towers during periods when the tower would be exposed to solar flux, temperature sensors within the towers and the room at the top, and the expected durations and frequency of the need to have workers at the top of a tower;
7. The manner in which access to the towers and the tower elevators would be controlled, including how a Lockout/Tag-out system would be implemented;
8. An Emergency Response Plan that would include a fire suppression plan to respond to emergencies in the tower, the type of PPE that would be available and required for workers both in a tower and those responding to an emergency in a tower to use in the event of a fire or smoke incidence, evacuation of workers, how the emergency hoist systems would be used, and evacuation or rescue of an injured worker from any level of the tower; and
9. The project owner shall provide the plans to the CPM for review and approval.

**VERIFICATION:** At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and approval a copy of the construction Tower Access and Safety Plan. The project owner shall also provide a copy of a letter to the CPM from the RCFD stating the RCFD's comments on the Construction Tower Access and Safety Plan, or a letter stating that no comments were received from the RCFD within 30 days of sending the plan to the RCFD.

At least 30 days prior to the start of commissioning (as defined by the CPM), the project owner shall submit to the CPM for review and approval a copy of the Operations Tower Access and Safety Plan. The project owner shall also provide a copy of a letter to the CPM from the RCFD stating the RCFD's comments on the Operations Tower Access and Safety Plan, or a letter stating that no comments were received from the RCFD within 30 days of sending the plan to the RCFD.

**WORKER SAFETY-12** The project owner shall report to the CPM within 24 hours of the incident any incidence of heat illness (heat stress, exhaustion, stroke, or prostration) occurring in any worker on site, and shall report to the CPM the incidence of any confirmed case of VF in any worker on the site within 24 hours of receipt of medical diagnosis.

**VERIFICATION:** The project owner shall provide reports of heat-related and VF incidences in any worker on the site via telephone call or e-mail to the CPM within 24 hours of a heat-related occurrence or confirmed diagnosis of a case of VF, and shall include such reports in the Monthly Compliance Report.

## **E. HAZARDOUS MATERIALS MANAGEMENT**

### **DESCRIPTION OF MODIFICATIONS**

The amended Palen Solar Energy Geothermal System Project (PSEGS) will occupy the same location as the certified Palen Solar Power Plant (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The PSEGS eliminates the use of solar trough technology and replaces it with BrightSource's solar tower technology. The most relevant modifications are that the PSEGS eliminates the use, transportation, and on-site storage of liquid petroleum gas (LPG) and the use, transportation and storage of millions of gallons of Therminol, the heat transfer fluid (HTF) utilized by the heliotrough technology. LPG will be replaced by the use of natural gas delivered to the site via underground pipeline. Therminol, which was to be used by the PSPP throughout the solar field, is flammable and the Hazardous Materials analysis during PSPP's certification process focused on its use, transport, storage and management and potential for leaks. Since the use of Therminol has been eliminated, the PSEGS will no longer require Land Treatment Units to handle and contain soil contaminated by spills or leaks of Therminol. Hazardous materials used during construction will be the same for the PSEGS as for the approved PSPP project. (Ex. 1003, p 4.3-1.)

The following evidence on Hazardous Materials Management was received into evidence on October 29, 2013: Exhibits: 1003, 1021, 1029, 1041, 1057, 1076, 2000, and 2008. (10/29/13 RT 37:16 – 38:7.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that that the storage, use, handling, and transportation of hazardous materials associated with the PSPP would not result in any significant direct or cumulative adverse public health and safety impacts. The Decision established that the major public health and safety danger associated with the project's hazardous materials use would be fire and explosion from liquefied petroleum gas (LPG or propane), or fire from Therminol VP-1 heat transfer fluid. However, the Decision specifically found that the risk of explosion and fire from LPG, or HTF was reduced below significant levels through adherence to applicable codes and the implementation of effective safety management practices. The Decision concluded that the PSPP complied with all hazardous materials laws, ordinances, regulations and standards (LORS) and the conditions of certification ensured that the project would not cause significant impacts to public health and safety as the result of handling, use, storage, or transportation of hazardous materials. (PSPP Final Decision, CEC-800-2010-011, Hazardous Materials Management, pp. 9-10.)

## THE AMENDED PROJECT'S IMPACTS

### Construction Impacts and Mitigation

A hazardous material is generally described as any substance or mixture of substances that have properties that are capable of having an adverse effect on human health and the environment. Hazardous materials handling is regulated at the federal, state, and local level. Regulations cover the transportation, labeling, handling, storage, disposal, and accidental releases of hazardous materials. Included within these regulations are reporting requirements for hazardous materials storage and usage, worker exposure protection, and reporting and spill response requirements. Hazardous material handling also covers response to incidental discovery of buried or unknown hazardous materials present in the subsurface environment. (Ex. 2000, p. 4.4-14.)

The evidence indicates that the PSEGS Project will use the same type and amount of hazardous materials as the approved PSPP Project during construction. These include paint, solvents, gasoline, diesel fuel, motor oil, lubricants, and welding gases. No acutely toxic hazardous materials will be used on site during construction, and none of these materials pose significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, their physical state, and/or their environmental mobility. Any impact of spills or other releases of these materials will be limited to the site because of the small quantities involved, their infrequent use (and therefore reduced chances of release), and/or the temporary containment berms used by contractors. Petroleum hydrocarbon-based motor fuels, mineral oil, lube oil, and diesel fuel are all characterized as very low volatility and represent limited off-site hazards even in larger quantities. (Exs. 1003, p. 4.3-1; 2000, p. 4.4-6.) Therefore, the PSEGS' impacts to public health and safety associated with the use of hazardous materials during construction will be similar to the impacts from the PSPP and remain less than significant.

### OPERATIONAL IMPACTS AND MITIGATION

During operations, hazardous chemicals such as cleaning agents, water treatment chemicals, welding gasses, oils, and other various chemicals will be used and stored in relatively small amounts and represent limited off-site hazards because of their small quantities, low volatility, and/or low toxicity (see **Hazardous Materials - Table 1** for a list of chemicals proposed to be used and stored at PSEGS during operations). The PSEGS will be limited to using, storing, and transporting only those hazardous materials listed in **Hazardous Materials - Table 1** pursuant to Condition of Certification **HAZ-1**. The quantities listed in **Hazardous Materials - Table 1** represent the amount of hazardous materials present on the entire site including both power blocks. (Ex. 2000, pp. 4.4-6 – 4.4-7.)

**Hazardous Materials - Table 1**  
**Hazardous Materials at the PSEGS**  
**(Based on Title 22 Hazard Characterization)**

<b>Material</b>	<b>Hazard Characteristics</b>	<b>Purpose</b>	<b>Storage Location</b>	<b>Maximum Stored</b>	<b>Storage Type</b>
Nalco Elimin-OX (Oxygen scavenger)	Ignitability	Oxygen scavenger for boiler chemistry	Power Block: Containers near power tower	1,600 gal <sup>1</sup>	400 gallon totes
Aqueous Ammonia  (19% concentration)	Reactivity, toxicity	pH control for boiler chemistry	Power Block: Containers near power tower	1,600 gal <sup>1</sup>	400 gallon totes
Sulfuric Acid  93% (66° Baumé)	Corrosivity, reactivity, toxicity	pH control	Power Block and Common Area: Containers located in Water Treatment Building	2,400 gal <sup>1</sup>	400 gallon totes
Sulfuric Acid (Batteries)	Corrosivity, reactivity, toxicity	Electrical power	Power Block: Contained within the main electrical room and the power tower  Common Area: Contained within main electrical room	12,000 gal	Batteries
Sodium Hydroxide (50% concentration)	Corrosivity, reactivity, toxicity	pH control	Power Block and Common Area: Containers located in Water Treatment Building	2,400 gal <sup>1</sup>	400 gallon totes
Diesel Fuel (No. 2)	Ignitability	Emergency generator	Power Block: Near fire pump, beneath emergency diesel generator, and adjacent to the mirror wash machines water filling station  Common Area: beneath emergency diesel generator and near fire pump	40,000 gal	Aboveground storage tanks and in equipment

Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Equipment Maintenance,	Power Block: Maintenance Shop	500 gal	1 gal and 5 gal containers
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Source: (Ex. 2000, pp. 4.4-34 – 4.4-36.)

Note 1: Assumes 2 totes at each power block

<b>Hazardous Materials Usage and Storage During Operation Based on Material Properties</b>					
<b>Material</b>	<b>Hazard Characteristics</b>	<b>Purpose</b>	<b>Storage Location</b>	<b>Maximum Stored</b>	<b>Storage Type</b>
Cleaning Chemicals and	Toxicity, irritant	Periodic cleaning of steam turbine	Power Block: Maintenance shop	3,000 gal	Misc. Manufacturer's containers
Nalco 5200M (Anti-scalant)	Irritant, mildly toxic	Wastewater treatment anti-scalant	Power Block: Containers near WWTS Common Area: Containers in Water Treatment Building (storage)	1,500 gal	300 gal totes
Nalco 3DT-187 (Corrosion Inhibitor)	Irritant, mildly toxic	Wet-Surface Air Cooler (WSAC) Corrosion inhibitor	Power Block: Containers near WSAC Common Area: Containers in Water Treatment Building (storage)	2,100 gal	300 gallon totes
Nalco 73801WR (Dispersant)	Irritant, mildly toxic	WSAC Dispersant	Power Block: Containers near WSAC Common Area: Containers in Water Treatment Building (storage)	2,100 gal	300 gallon tote
Nalco TRAC107 (Corrosion Inhibitor)	Irritant, mildly toxic	Closed cooling water Corrosion Inhibitor	Power Block: Contained within CCW system Common Area: Containers in water treatment building (storage)	500 gal	55 drums

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Avista Vitec (Scale Inhibitor)	Irritant, mildly toxic	Reverse osmosis scale inhibitor	Power Block and Common Area: Containers in Water Treatment Building	900 gal	300 gallon totes
Sodium Bisulfite	Irritant, mildly toxic	Dechlorination	Power Block and Common Area: Containers in Water Treatment Building	900 gal	300 gallon totes
Nalco 7468 (Anti-foaming agent)	Irritant, mildly toxic	Wastewater treatment system anti-foaming agent	Power Block: Containers near WWTS  Common Area: Containers in Water Treatment Building (storage)	1,500 gal	300 gallon totes

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Lubricating Oil	Mildly toxic	Miscellaneous equipment lubrication	Power Block: Contained within equipment, drums during replacement  Common Area: Contained within equipment, spare capacity stored in Maintenance shop	30,000 gal	Contained within equipment and misc. drums during replacement
Mineral Transformer Insulating Oil	Mildly toxic	Provides overheating and insulation protection for transformers	Power Block: Contained within transformers Common Area: Contained within transformers	112,000 gal	Transformers

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Hydraulic Oil	Mildly toxic	Miscellaneous equipment control oil	Power Block: Contained within equipment, drums during replacement  Common Area: Contained within equipment, spare capacity stored in Warehouse	6,000 gal	Contained within equipment and misc. drums during replacement
Sodium Hypochlorite 12% (trade) solution	Irritant, Corrosivity, reactivity	Biocide	Power Block: Containers in water treatment building  Common Area: Potable water treatment area	2,400 gal	300 gal totes

Source: (Ex. 2000, pp. 4.4-6 – 4.4-7)

### Sulfuric Acid and Sodium Hydroxide

Sulfuric acid and sodium hydroxide can pose a risk to the off-site public and on-site workers only through direct contact due to their very low vapor pressures. These hazardous materials will be delivered in self-contained totes and will not be stored at any one location on the site in a quantity greater than 400 gallons. We find that the risk of impact to the off-site public is less than significant. (Ex. 2000, p. 4.4-7.)

### Natural Gas

Natural gas poses a fire and explosion risk because of its flammability. Natural gas is composed of mostly methane, but also contains ethane, propane, nitrogen, butane, isobutene, and isopentane. It is colorless, odorless, tasteless and lighter than air. Natural gas can cause asphyxiation when methane is 90 percent in concentration. Methane is flammable when mixed in air at concentrations of 5-14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or possible explosion if a release occurs under certain specific conditions. However, due to its tendency to disperse rapidly, natural gas is less likely to cause explosions than many other fuel gases such as propane or liquefied petroleum gas, but can explode under certain confined conditions (as demonstrated by the natural gas detonation in Belgium in July 2004, and in San Bruno, California, in September 2010). (Ex. 2000, p. 4.4-7.)

While natural gas will be used in significant quantities, it will not be stored on site. It will be delivered by the Southern California Gas Company (SoCal Gas) via a new pipeline that will extend southward from the site and interconnect with an existing SoCal Gas transmission pipeline located just south of Interstate Highway 10 (I-10). The new gas pipeline will be approximately 8 inches in diameter and be approximately 2,956 feet long. SoCal Gas will construct, own, and operate the new gas pipeline as part of its extensive gas supply system. (Ex. 2000, p. 4.4-7.)

The evidence indicates that the risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and the development and implementation of effective safety management practices. The National Fire Protection Association (NFPA), code 85A, requires both the use of double-block and bleed valves for gas shut off and automated combustion controls. These measures will significantly reduce the likelihood of an explosion in gas-fired equipment. Additionally, start-up procedures require air purging of the gas turbines prior to start up, thereby precluding the presence of an explosive mixture. The safety management plan proposed by the project owner will address the handling and use of natural gas, which significantly reduces the potential for equipment failure because of either improper maintenance or human error. The evidence indicates that existing LORS are sufficient to ensure minimal risks of pipeline failure. (Ex. 2000p. 4.4-7 – 4.4-8.)

In light of evidence that demonstrates that flammable gas blows for the purpose of pipe cleaning is unsafe, Condition of Certification **HAZ-4** prohibits the use of flammable-gas blows for pipe cleaning at the facility either during construction or after the start of operations. All fuel gas-pipe purging activities shall vent any gases to a safe location outdoors, away from workers and sources of ignition. Fuel gas-pipe cleaning and purging must adhere to the provisions of NFPA 56, the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems, with special emphasis on sections 4.3.1 (written procedures for pipe cleaning and purging) and 6.111 (prohibition on the use of flammable gas for cleaning or purging at any time). (Ex. 2000, p. 4.4-8.)

We find that with implementation of Condition of Certification **HAZ-4** and compliance with existing LORS, the risk of fire, explosion or other natural gas pipeline failure is less than significant.

### **Aqueous Ammonia**

Aqueous ammonia will be used to control the emission of oxides of nitrogen (NO<sub>x</sub>) from the combustion of natural gas at the PSEGS. The accidental release of aqueous ammonia without proper mitigation can result in significant down-wind concentrations of ammonia gas. The PSEGS will contain 19 percent aqueous ammonia solution in two

stationary 400 gallon above-ground storage totes at each power block for a total maximum volume on site of 1,600 gallons. (Exs. 1003, p. 4.3-2; 2000, p. 4.4-8.)

The use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its moderate vapor pressure and the volume of aqueous ammonia that will be used and stored on site. However, the use of aqueous ammonia poses far less risk than the use of the far more hazardous anhydrous ammonia (ammonia that is not diluted with water). (Ex. 2000, p. 4.4-8.)

The record indicates that if the potential exposure associated with a release of aqueous ammonia exceeds 75 ppm at any public receptor, then the potential release poses a risk of significant impact. The record assessed the probability of occurrence of the release and/or the nature of the potentially exposed population in determining whether the likelihood and extent of potential exposure would be sufficient to support a finding of potentially significant impact. (Ex. 2000, p. 4.4-8.)

The evidence shows that the risk of off-site impacts of a release of aqueous ammonia is extremely low and that the maximum of each tote is 400 gallons. Totes are self-contained units that do not involve the transfer of aqueous ammonia from a tanker truck to a large storage tank because they are delivered already containing the aqueous ammonia. Each tote will have secondary spill containment to limit the spread of any spilled aqueous ammonia, thus limiting the size of the pool of ammonia available for evaporation and dispersion. The evidence suggests that far greater amounts of aqueous ammonia spilling into secondary containment areas show very limited dispersion of ammonia and the distance to a level less than 75 ppm is usually only a few hundred feet from the source. Totes have an excellent safety record of structural integrity and minimal spills and the chance that more than one would fail at the same time is extremely remote. (Ex. 2000, pp. 4.4-8 -4.4-9)

The nearest off-site public receptors are two homes. The first is located approximately 25 feet northwest of the project fence line approximately one mile (5,280 ft.) from the nearest tote of aqueous ammonia at a power block. The second is located approximately 3,500 feet northwest of the project fence line and one and two-thirds miles (8,720 ft.) from the nearest tote of aqueous ammonia at a power block. A vehicle traveling on I-10 would come no closer than three quarters of a mile (4,000 ft) from the nearest ammonia tote at a power block (Exs. 1003, Figure 2 and **Appendix A** p. 10; 2000, p. 4.4-9).

Therefore, we find that any spill of aqueous ammonia from any one of the four totes on the site will not result in an airborne concentration of 75 ppm or greater ammonia at any off-site location and will pose a less-than-significant risk to the public.

## **Mitigation**

PSEGS' use of hazardous materials poses a less-than-significant risk to the environment and public health, but only with implementation of the mitigation measures. The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a Safety Management Program that includes both engineering and administrative controls. (Ex. 2000, p. 4.4-2.)

## **Engineering Controls**

Engineering controls help to prevent accidents and releases (spills) from moving off site and affecting communities by incorporating engineering safety design criteria in the design of the project. The engineered safety features proposed by the project owner for use at the PSEGS Project include:

- storage of small quantity hazardous materials in original, properly labeled containers (“totes”);
- construction of secondary containment areas surrounding each of the bulk hazardous materials storage areas designed to contain accidental releases that might happen during storage or delivery, plus the volume of rainfall associated with a 25-year, 24-hour storm;
- physical separation of stored chemicals in isolated containment areas in order to prevent accidental mixing of incompatible materials, which could result in the evolution and release of toxic gases or fumes; and,
- installation of a fire protection system for hazardous materials storage areas. (Ex. 2000, p. 4.4-9 - 4.4-10.)

## **Administrative Controls**

Administrative controls help prevent accidents and releases (spills) from moving off site and affecting neighboring communities by establishing worker training programs, process safety management programs, and complying with all . (Ex. 2000, p. 4.4-10.)

A worker health and safety program will be prepared by the project owner and include, inter alia, the following elements (see the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision for specific regulatory requirements):

- worker training regarding chemical hazards, health and safety issues, and hazard communication;
- procedures to ensure the proper use of personal protective equipment;
- safety operating procedures for the operation and maintenance of systems utilizing hazardous materials;

- fire safety and prevention; and,
- emergency response actions including facility evacuation, hazardous material spill clean-up, and fire prevention including the preparation of a Spill Prevention, Control, and Countermeasure (SPCC) Plan.

At the facility, the project owner shall designate an individual with the responsibility and authority to ensure a safe and healthful work place. The project health and safety official will oversee the health and safety program and have the authority to halt any action or modify any work practice to protect the workers, facility, and the surrounding community in the event of a violation of the health and safety program. (Ex. 2000, p. 4.4-10.)

Existing Condition of Certification **HAZ-1** ensures that no hazardous material will be used at the facility except as listed in **Hazardous Materials - Table 1**. Condition of Certification **HAZ-1** also requires changes to the allowed list of hazardous materials and their maximum amounts to be approved by the Energy Commission Compliance Project Manager (CPM). Only those that are needed and appropriate will be allowed to be used. (Ex. 2000, p. 4.4-10.)

Additional administrative controls are required by revised Condition of Certification **HAZ-2** (preparation of a HMBP and a SPCC Plan) and existing Condition of Certification **HAZ-3** (development of a Safety Management Plan). (Ex. 2000, p. 4.4-11.)

### **On-Site Spill Response**

PSEGS shall prepare and implement an emergency response plan that includes information on hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on-site spill containment, and prevention equipment and capabilities, as well as other elements. Emergency procedures shall be established which include evacuation, spill cleanup, hazard prevention, and emergency response. The presence of oil in a quantity greater than 1,320 gallons might invoke a requirement to prepare an SPCC Plan. The quantity of oil contained in any one of the planned 230/500 kV transformers will be in excess of the minimum quantity that requires such a plan. In addition, pursuant to California HSC sections 25270 through 25270.13, the PSEGS will be required to prepare an SPCC because it will store 10,000 gallons or more of petroleum on site. These regulations also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the CUPA. (Ex. 2000, p. 4.4-11.)

Plant personnel shall be trained as a hazardous materials response team which will be the first responder to hazardous materials incidents. In the event of a large incident involving hazardous materials, backup support would be provided by the Riverside County Fire Department which has a hazmat response unit capable of handling any

incident at the proposed PSEGS, but would respond in about 1.5-2 hours. (Ex. 2000, p. 4.4-11.)

### **Transportation of Hazardous Materials**

Various containerized and bulk hazardous materials would be transported to the facility via truck. While many types of hazardous materials will be transported to the site, the evidence suggests that transport of aqueous ammonia poses the predominant risk associated with hazardous materials transport. It should be noted that previous modeling of spills, involving much larger quantities of aqueous ammonia than will be used, stored and transported to the proposed PSEGS, has demonstrated that significant airborne concentrations would occur only at short distances from the spill. (Ex. 2000, p. 4.4-11.)

It is appropriate to rely upon the extensive regulatory program that applies to the shipment of hazardous materials on California highways to ensure safe handling in general transportation (see Federal Hazardous Materials Transportation Law, 49 USC §5101 et seq., DOT regulations 49 CFR, subpart H, §172–700, and California Department of Motor Vehicles (DMV) regulations on hazardous cargo). These regulations also address the issue of driver competence. (Ex. 2000, p. 4.4-11.)

Based on the environmental mobility, toxicity, the quantities at the site, and the use of totes, we find that the risk associated with the transportation of hazardous materials to the proposed modified project is less than significant. (Ex. 2000, p. 4.4-12.)

### **Seismic Issues**

It is possible that an earthquake could cause the failure of hazardous materials storage tanks. An earthquake could also cause failure of the secondary containment system (berms and dikes), as well as the failure of electrically controlled valves and pumps. The failure of all of these preventive control measures might then result in leaks of chemicals or of natural gas that may cause fires or impact the environment. (Ex. 2000, p. 4.4-12.)

The record contains an analysis of the codes and standards which should be followed when designing and building storage tanks and containment areas to withstand a large earthquake. We note that the previously approved PSPP Project would have been designed and constructed to the standards of the 2010 California Building Code for Seismic Risk Zone 4 and the PSEGS will also meet these seismic design criteria. (Ex. 2000, p. 4.4-12.)

Therefore, based on the analytical evidence contained in the record, we find that tank failures during seismic events are not probable and do not represent a significant risk to the public.

## Site Security

The energy generation sector is one of 14 areas of critical infrastructure listed by the U.S. Department of Homeland Security (DHS). On April 9, 2007, the U.S. Department of Homeland Security published, in the Federal Register (6 CFR, part 27), an Interim Final Rule (Chemical Facility Anti-Terrorism Standards or CFATS) requiring facilities that use or store certain hazardous materials to conduct vulnerability assessments and implement certain specified security measures. PSEGS is not proposing to use any material in an amount that would trigger the need for compliance with the CFATS regulation. (Ex. 2000, p. 4.4-13.)

In order to ensure that this facility (or a shipment of hazardous material) is not the target of unauthorized access, existing Condition of Certification **HAZ-5** and revised Condition of Certification **HAZ-6** address both construction security and operations security plans. These plans would require the implementation of site security measures that are consistent with both the above-referenced documents and California Energy Commission guidelines. (Ex. 2000, p. 4.4-13.)

The goal of these conditions of certification is to provide the minimum level of security for power plants needed to protect California's electrical infrastructure from malicious mischief, vandalism, or domestic/foreign terrorist attacks. The level of security needed for this power plant is dependent upon the threat imposed, the likelihood of an adversarial attack, the likelihood of success in causing a catastrophic event, and the severity of consequences of that event. (Ex. 2000, p. 4.4-13.)

Undisputed evidence establishes that the PSEGS would fall into the "low vulnerability" category, therefore we will require that certain security measures be implemented, but the project owner will not conduct its own vulnerability assessment. (Ex. 2000, p. 4.4-13.)

These security measures include perimeter fencing and breach detectors, possibly guards, alarms, site access procedures for employees and vendors, site personnel background checks, and law enforcement contact in the event of a security breach. The requirement for the standard security measure of topping the 8-foot-high perimeter fence with barbed wire has been removed to reduce the risk to birds in the area flying into the barbed wire or to kit foxes climbing the fences. Instead, the project owner must either install on-site breach detectors to be located inside the perimeter; closed circuit television (CCTV) capable of viewing the entire length of the perimeter fence; and/or routine and random guard patrols on a road inside and along the perimeter fence. (Ex. 2000, p. 4.4-13.)

Site access for vendors will be strictly controlled. Consistent with current state and federal regulations governing the transport of hazardous materials, hazardous materials

vendors will have to maintain their transport vehicle fleets and employ only drivers who are properly licensed and trained. The project owner will be required, through its contractual language with vendors, to ensure that vendors (if required by law) supplying hazardous materials strictly adhere to the U.S. Department of Transportation requirements that hazardous materials vendors prepare and implement security plans per 49 CFR 172.802, and ensure that all hazardous materials drivers are in compliance with personnel background security checks per 49 CFR, part 1572, subparts A and B. The CPM may authorize modifications to these measures, or may require additional measures in response to additional guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or NERC, after consultation with appropriate law enforcement agencies and the project owner. (Ex. 2000, p. 4.4-14.)

### **Non-Operation and Facility Closure Impacts and Mitigation**

Closure of the PSEGS (temporary or permanent) will follow the facility closure plan approved for the original PSPP Project. The facility closure plan is designed to minimize public health and environmental impacts. Non-operation and facility closure procedures must be consistent with all applicable LORS and includes monitoring of hazardous materials storage vessels, safe cessation of processes that use hazardous materials, disposal of hazardous materials and hazardous wastes, and documentation of practices and inventory. Impacts from non-operation and the facility closure process represent a fraction of the impacts associated with the construction or operation of the PSEGS. Therefore, we find that hazardous-materials-related impacts from non-operations and facility closure are insignificant. (Ex. 2000, p. 4.4-14.)

We find that construction and operation of the PSEGS Project would be in compliance with all applicable LORS regarding long-term and short-term project impacts in the area of hazardous materials management. (Ex. 2000, p. 4.4-17.)

## **RED BLUFF SUBSTATION**

### **Environmental Setting**

The PSEGS will have a transmission interconnection to the SCE Red Bluff Substation, which is due to be completed in December 2013, located in eastern Riverside County, California on undeveloped BLM desert adjacent to the existing DPV1 500 kV transmission line and the proposed DPV 2 500 kV transmission line. Interstate 10 and SR 177 (Rice Road) are the primary highways providing vehicular access throughout this region. (Ex. 2000, p. 4.4-14.)

The PSEGS will use small quantities of a number of hazardous chemicals during construction of the SCE Red Bluff Substation. The record indicates that existing safeguards and measures imposed on construction greatly reduce the opportunity for,

or the extent of, exposure to hazardous materials or other hazards. To date, no incidents of releases have been reported. (Ex. 2000, p. 4.4-14.)

### **Exposed Populations and Sensitive Receptors**

The record establishes that there are no sensitive receptors within 1,000 feet of the SCE Red Bluff Substation site located south of I-10. The nearest residences are located north of the I-10 highway. (Ex. 2000, p. 4.4-14.)

### **Environmental Impacts**

Construction activities for the Red Bluff Substation include the handling and use of hazardous materials associated with general construction activities, such as heavy equipment operations. Hazardous materials including fuels, oils, and other vehicle and equipment maintenance fluids may be used during the on-going construction phase of the project and are stored at the project substation sites and construction staging areas. Improperly maintained vehicles and equipment could leak fluids during the on-going construction activities and while parked. There is a potential for incidents involving release of gasoline, diesel fuel, oil, hydraulic fluid, and/or lubricants from vehicles or other equipment at the staging areas and/or the project sites. Spills and leaks of hazardous materials during construction activities could potentially result in soil or groundwater contamination and improper handling of hazardous materials could expose project workers or the nearby public to hazards. To date no reported leaks or spills occurred. Implementing mitigation measures has avoided potential significant hazard impacts from work associated with the SCE Red Bluff Substation. (Ex. 2000, p. 4.4-14.)

### **CUMULATIVE IMPACTS**

The **PROJECT DESCRIPTION** section of this Decision provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario that forms the basis of the cumulative impact analysis for the PSEGS Project. In summary, these projects are placed into three categories:

- Existing energy projects on BLM, State, and private lands: 12 projects are identified in the **Project Description - Table 2**;
- Foreseeable future energy projects in the immediate area and in the desert region: 139 foreseeable projects are identified in the **Project Description - Table 3**; and
- Past and present non-energy projects on BLM, State, and private lands: eight projects are identified in **Project Description - Table 4**. (Ex. 2000, p. 4.4-15.)

All of the above projects are defined within a geographic area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or

environmental parameters. Most of these projects have, are, or will be required to undergo their own independent environmental review under the California Environmental Quality Act (CEQA). Even if the cumulative projects described in the **PROJECT DESCRIPTION** section have not yet completed the required environmental review processes, they were considered in the cumulative impacts analyses in this section. (Ex. 2000, p. 4.4-15.)

### **Effects of Past and Present Projects**

For this analysis, we assume that many, if not all, of these projects or developments in the area or region have, or will use, store, and/or transport, small quantities of hazardous materials. However, for the reasons stated below, we find that when combined with the PSEGS, none would have a cumulative impact on the region. The use of hazardous materials in large quantities is neither frequent nor concentrated in this area and the distances between the projects are very great. Operating, under construction, or proposed power plants in the region that store, use, and/or transport hazardous materials in the area have had any direct hazardous materials management impacts mitigated to a level of less than significance. (Ex. 2000, p. 4.4-16.)

A significant cumulative hazardous materials impact is defined as the simultaneous uncontrolled release of hazardous materials from multiple locations in a form (gas or liquid) that could cause a significant impact where the release of one hazardous material alone would not cause a significant impact. Existing locations that use or store gaseous or liquid hazardous materials, or locations where such facilities might likely be built, were both considered. Although cumulative impacts are theoretically possible, they are not probable because of the many safeguards implemented to both prevent and control an uncontrolled release. The chances of one uncontrolled release occurring are remote. The chance of two or more releases occurring simultaneously, with resulting airborne plumes mingling to create a cumulatively considerable impact, are even more remote. We find the cumulative risk to the public is insignificant. (Ex. 2000, p. 4.4-16.)

The project owner will develop and implement a hazardous-materials-handling program for the PSEGS independent of any other projects considered for potential cumulative impacts. The facility, as proposed by the project owner and with the additional mitigation measures imposed in this Decision, poses a minimal risk of an accidental release that could result in off-site impacts. It is unlikely that an accidental release that has very low probability of occurrence (about one in one million per year) would independently occur at this site and another facility at the same time. Therefore, we find that the facility will not contribute to a significant hazardous-materials-related cumulative impact. (Ex. 2000, p. 4.4-17.)

## **Contribution of the Palen Solar Electric Generating System to Cumulative Impacts**

The construction of PSEGS will not result in short-term adverse impacts related to hazardous materials use during construction activities. Some of the cumulative projects described above that are not yet built may be under construction at the same time as the PSEGS, however, short-term impacts related to Hazardous Materials Management during construction of those cumulative projects are unlikely to occur. (Ex. 2000, p. 4.4-17.)

The operation of the PSEGS will not result in long-term adverse impacts during operation of the project related to hazardous materials management, even though some of the cumulative projects described above may be operational at the same time as the PSEGS. (Ex. 2000, p. 4.4-17.)

Closing the PSEGS facility is not likely to result in adverse impacts related to hazardous materials management. It is improbable that the construction or decommissioning of any of the cumulative projects would occur concurrently with the facility closure of this project, because the closure may not occur for approximately 40 years. We find that significant impacts related to hazardous materials management during decommissioning of the PSEGS generated by the cumulative projects would not occur. (Ex. 2000, p. 4.4-17.)

The potential for off-site impacts resulting from hazardous materials use at the PSEGS is less than significant due to the nature of the materials used and the engineering and administrative controls that will be implemented to prevent and control accidental releases of hazardous materials. Because of this determination, and the additional fact that there are no existing or future foreseeable facilities using large amounts of hazardous chemicals in the immediate proximity (less than 1 mile), there is little (if any) possibility that vapor plumes will combine to produce an airborne concentration that would present a significant risk should an accidental release occur. (Ex. 2000, p. 4.4-17.)

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The LORS applicable to hazardous materials management are contained in **Appendix A** of this Decision. Construction and operation of the PSEGS project would comply with all applicable LORS regarding long-term and short-term project impacts in the area of hazardous materials management. (Ex. 2000, p. 4.4-18.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings

necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs. , tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Throughout this Decision, we describe various benefits that will accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. The PSEGS site is designated “Developable” in BLM’s Eastern Riverside County Solar Energy Zone. In addition, as described in this Decision, power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the parabolic technology. Furthermore, the PSEGS project would use less hazardous materials than the approved project in that solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion. (Ex. 1003, p. 1-2 – 1-3.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding hazardous materials management.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The PSEGS will use hazardous materials during construction and operation.
2. No acutely-toxic hazardous materials will be used on site during construction.
3. The major public health and safety danger associated with the project from hazardous materials use is fire and explosion from natural gas.
4. The risk of explosion and fire from natural gas will be reduced to insignificant levels through adherence to applicable codes and the implementation of effective safety management practices.
5. The PSEGS’ use of aqueous ammonia can result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals.
6. Any spill of aqueous ammonia from any one of the four totes on the site will not result in an airborne concentration of 75 ppm or greater ammonia at any off-site location, and thus will pose a less-than-significant risk to the public.

7. Based on the environmental mobility, toxicity, the quantities at the site, and the use of totes, we find that the risk associated with the transportation of hazardous materials to the PSEGS project is less than significant.
8. Based on experience through recent seismic events, tank failures during earthquakes are not probable and do not represent a significant risk to the public.
9. Potential impacts from the other hazardous substances used on site are not significant since quantities will be limited and appropriate storage will be maintained in accordance with applicable law.
10. The hazardous materials transportation associated with the PSEGS project would not significantly increase the cumulative risks associated with regional hazardous materials transportation.
11. The risk of significant cumulative impacts originating from simultaneous releases of hazardous materials from the PSEGS and nearby facilities is remote and presents no significant risk to the public.
12. Local emergency responders are adequately equipped and trained to deal with hazardous materials accidents at the PSEGS.
13. Hazardous materials-related impacts from non-operations and facility closure are insignificant.
14. Implementation of the mitigation measures described in the evidence and contained in the conditions of certification, below, ensures that the project will not cause significant impacts to public health and safety as the result of handling, use, storage, or transportation of hazardous materials.
15. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. PSEGS' use, storage, and transportation of hazardous materials will have no significant impacts on public health or the environment.
2. With implementation of the conditions of certification below, the Palen Solar Project will comply with all applicable LORS related to hazardous-materials management as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.

The change in the project will be beneficial to the public, Petitioner, and Intervenor by the PSEGS site being designated "Developable" in BLM's Eastern Riverside County Solar Energy Zone. The power tower technology eliminates the use of millions of

gallons of flammable Therminol, the heat transfer fluid utilized by the PSPP's parabolic trough technology. Furthermore, the PSEGS project will use less hazardous materials than the PSPP project and the solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion.

3. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process, because at the time of the original licensing, the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

### **CONDITIONS OF CERTIFICATION**

**HAZ-1** The project owner shall not use any hazardous material not listed in table 1, above, or in greater quantities or strengths than those identified by chemical name in Hazardous Materials **Appendix A**, below, unless approved in advance by the CPM.

**VERIFICATION:** The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility.

**HAZ-2** The project owner shall concurrently provide a Hazardous Materials Business Plan (HMBP) and a Spill Prevention, Control, and Countermeasure Plan (SPCC), to the Riverside County Department of Environmental Health (RCDEH), the Riverside County Fire Department (RCFD), and the CPM for review. After receiving comments from the RCDEH, RCFD, and the CPM, the project owner shall include in the final documents all recommendations that ensure LORS compliance. Copies of the final HMBP and SPCC Plan shall then be provided to the RCDEH and RCFD for information and to the CPM for approval. The project owner shall also pay the usual and customary fee for RCDEH and RCFD review of those plans, and the usual and customary fee for any necessary and required inspections regarding same.

**VERIFICATION:** At least 30 days prior to receiving any hazardous material on the site for commissioning or operations, the project owner shall provide a copy of a final Hazardous Materials Business Plan, Spill Prevention, Control, and Countermeasures Plan to the CPM for approval.

The project owner shall also provide proof that the plans were submitted to the RCDEH and RCFD for review and that the usual and customary fees for those reviews have been paid.

The project owner shall also provide proof in the Annual Compliance Report that the usual and customary fee for any necessary and required inspections by the RCEHD and the RCFD have been paid.

**HAZ-3** The project owner shall develop and implement a Safety Management Plan for the delivery and handling of liquid and gaseous hazardous materials. The plan shall include procedures, protective equipment requirements, training, and a checklist. It shall also include a section describing all measures to be implemented to prevent mixing of incompatible hazardous materials. This plan shall be applicable during construction, commissioning, and operation of the power plant.

**VERIFICATION:** At least 30 days prior to the delivery of any liquid or gaseous hazardous material to the facility, the project owner shall provide a Safety Management Plan as described above to the CPM for review and approval.

**HAZ-4:** The project owner shall not allow any fuel gas-pipe cleaning activities on site, either before placing the pipe into service or at any time during the lifetime of the facility, that involves “flammable gas blows” where natural (or flammable) gas is used to blow out debris from piping and then vented to atmosphere. Instead, an inherently safer method involving a non-flammable gas (e.g. air, nitrogen, steam) or mechanical pigging shall be used as per NFPA 56. A written procedure shall be developed and implemented as per NFPA 56, section 4.3.1

**VERIFICATION:** At least 30 days before any fuel gas-pipe cleaning activities begin, the project owner shall submit a copy of the Fuel Gas-Pipe Cleaning Work Plan (as described in NFPA 56, section 4.3.1), which shall indicate the method of cleaning to be used, what gas will be used, the source of pressurization, and whether a mechanical PIG will be used, to the CBO for information and to the CPM for review and approval.

**HAZ-5** Prior to commencing construction, a site-specific Construction Site Security Plan for the construction phase shall be prepared and made available to the CPM for review and approval. The Construction Security Plan shall include the following:

1. perimeter security consisting of fencing enclosing the construction area;
2. security guards;

3. site access control consisting of a check-in procedure or tag system for construction personnel and visitors;
4. written standard procedures for employees, contractors and vendors when encountering suspicious objects or packages on site or off site;
5. protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
6. evacuation procedures.

**VERIFICATION:** At least 30 days prior to commencing construction, the project owner shall notify the CPM that a site-specific Construction Security Plan is available for review and approval.

**HAZ-6** The project owner shall also prepare a site-specific operations security plan for the operational phases that shall be made available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage. The level of security to be implemented shall not be less than that described below (as per NERC 2002).

The Operation Security Plan shall include the following:

1. Permanent full perimeter fence or wall, at least eight feet high;
2. Main entrance security gate, either hand operated or motorized;
3. Evacuation procedures;
4. Protocol for contacting law enforcement and the CPM in the event of suspicious activity or emergency; and
5. Written standard procedures for employees, contractors, and vendors when encountering suspicious objects or packages on site or off site including:
  - A. A statement (refer to sample **Attachment A**), signed by the project owner certifying that background investigations have been conducted on all project personnel. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy; and
  - B. A statement(s) (refer to sample, **Attachment B**), signed by the contractor or authorized representative(s) for any permanent

contractors or other technical contractors (as determined by the CPM after consultation with the project owner), that are present at any time on the site to repair, maintain, investigate, or conduct any other technical duties involving critical components (as determined by the CPM after consultation with the project owner) certifying that background investigations have been conducted on contractors who visit the project site. Background investigations shall be restricted to determine the accuracy of employee identity and employment history and shall be conducted in accordance with state and federal laws regarding security and privacy;

1. Site access controls for employees, contractors, vendors, and visitors;
2. A statement(s), if required, (refer to sample, Attachment C), signed by the owners or authorized representative of hazardous materials transport vendors, certifying that they have prepared and implemented security plans in compliance with 49 CFR 172.802, and that they have conducted employee background investigations in accordance with 49 CFR, part 1572, subparts A and B;
3. Closed circuit TV (CCTV) monitoring system, recordable, and viewable in the power plant control room and security station (if separate from the control room) with cameras able to pan, tilt, and zoom, have low-light capability, and are able to view the outside entrance to the control room, the front gate, and key areas of the power block areas; and
4. Additional measures to ensure adequate perimeter security consisting of either:
  - A. Security guard(s) present 24 hours per day, 7 days per week and conducting both routine and random patrols; or
  - B. Perimeter breach detectors or C. CCTV able to view 100 percent of the perimeter fence.

The project owner shall fully implement the security plans and obtain CPM approval of any substantive modifications to those security plans. The CPM may authorize modifications to these measures, or may require additional measures, such as protective barriers for critical power plant components (e.g. transformers, gas lines, compressors, etc.) or cyber security depending upon circumstances unique to the facility or in response to industry-related standards, security concerns, or additional

guidance provided by the U.S. Department of Homeland Security, the U.S. Department of Energy, or the North American Electrical Reliability Council, after consultation with both appropriate law enforcement agencies and the project owner.

**VERIFICATION:** At least 30 days prior to the initial receipt of hazardous materials on site for commissioning or operations, the project owner shall notify the CPM that a site-specific Operations Site Security Plan is available for review and approval. In the annual compliance report, the project owner shall include a statement that all current project employee and appropriate contractor background investigations have been performed, and that updated certification statements have been appended to the operations security plan. In the Annual Compliance Report, the project owner shall include a statement that the operations security plan includes all current hazardous materials transport vendor certifications for security plans and employee background investigations.

**SAMPLE CERTIFICATION (Attachment A)  
Affidavit of Compliance for Project Owners**

I,

---

(Name of Person Signing Affidavit) (Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

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(Company Name)

for employment at

---

(Project Name and Location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

---

(Signature of Officer or Agent)

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

**SAMPLE CERTIFICATION (Attachment B)  
Affidavit of Compliance for Contractors**

I,

---

(Name of Person Signing Affidavit) (Title)

do hereby certify that background investigations to ascertain the accuracy of the identity and employment history of all employees of

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(Company Name)

for contract work at

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(Project Name and Location)

have been conducted as required by the California Energy Commission Decision for the above-named project.

---

(Signature of Officer or Agent)

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

**SAMPLE CERTIFICATION (Attachment C)**  
**Affidavit of Compliance for Hazardous Materials Transport Vendors**

I,

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(Name of Person Signing Affidavit) (Title)

do hereby certify that the below-named company has prepared and implemented security plans in conformity with 49 CFR 172.802 and has conducted employee background investigations in conformity with 49 CFR 172, subparts A and B,

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(Company Name)

for hazardous materials delivery to

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(Project Name and Location)

as required by the California Energy Commission Decision for the above-named project.

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(Signature of Officer or Agent)

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20 \_\_\_\_\_.

THIS AFFIDAVIT OF COMPLIANCE SHALL BE APPENDED TO THE PROJECT SECURITY PLAN AND SHALL BE RETAINED AT ALL TIMES AT THE PROJECT SITE FOR REVIEW BY THE CALIFORNIA ENERGY COMMISSION COMPLIANCE PROJECT MANAGER.

**Hazardous Materials Appendix A**  
**Hazardous Materials Proposed for Use at the PSEGS**  
**(Total Amounts to be Located on the Entire Site)**

Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Nalco Elimin-OX  (Oxygen scavenger)	Ignitability	Oxygen scavenger for boiler chemistry control	Power Block:  Containers near power tower	1,600 gal <sup>1</sup>	400 gallon totes
Aqueous Ammonia	Reactivity, toxicity	pH control for boiler chemistry	Power Block:  Containers near power tower	1,600 gal <sup>1</sup>	400 gallon totes
Sulfuric Acid  93% (66° Baumé)	Corrosivity, reactivity, toxicity	pH control	Power Block and Common Area:  Containers located in Water Treatment Building	2,400 gal <sup>1</sup>	400 gallon totes
Sulfuric Acid  (Batteries)	Corrosivity, reactivity, toxicity	Electrical power	Power Block:  Contained within the main electrical room and the power tower  Common Area:  Contained within main electrical room	12,000 gal	Batteries
Sodium Hydroxide (50% concentration)	Corrosivity, reactivity, toxicity	pH control	Power Block and Common Area:  Containers located in Water Treatment Building	2,400 gal <sup>1</sup>	400 gallon totes

Diesel Fuel (No. 2)	Ignitability	Emergency generator	Power Block:  Near fire pump, beneath emergency diesel generator, and adjacent to the mirror wash machines water filling station  Common Area: beneath emergency diesel generator and near fire pump	40,000 gal	Aboveground storage tanks and in equipment
Paint, solvents, adhesives, cleaners, sealants, lubricants	Toxicity	Equipment Maintenance,	Power Block:  Maintenance Shop	500 gal	1 gal and 5 gal containers

<b>Hazardous Materials Usage and Storage During Operation Based on Material Properties</b>					
<b>Material</b>	<b>Hazard Characteristics</b>	<b>Purpose</b>	<b>Storage Location</b>	<b>Maximum Stored</b>	<b>Storage Type</b>
Cleaning Chemicals and Detergents	Toxicity, irritant	Periodic cleaning of steam turbine	Power Block: Maintenance shop	3,000 gal	Misc. Manufacturer's containers
Nalco 5200M (Anti-scalant)	Irritant, mildly toxic	Wastewater treatment anti-scalant	Power Block:  Containers near WWTS  Common Area:  Containers in Water Treatment Building (storage)	1,500 gal	300 gal totes

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Nalco 3DT-187 (Corrosion Inhibitor)	Irritant, mildly toxic	Wet-Surface Air Cooler (WSAC) Corrosion inhibitor	Power Block:  Containers near WSAC  Common Area:  Containers in Water Treatment Building (storage)	2,100 gal	300 gallon totes
Nalco 73801WR (Dispersant)	Irritant, mildly toxic	WSAC Dispersant	Power Block:  Containers near WSAC  Common Area:  Containers in Water Treatment Building (storage)	2,100 gal	300 gallon tote
Nalco TRAC107 (Corrosion Inhibitor)	Irritant, mildly toxic	Closed cooling water Corrosion Inhibitor	Power Block:  Contained within CCW system  Common Area:  Containers in water treatment building (storage)	500 gal	55 drums
Avista Vitec (Scale Inhibitor)	Irritant, mildly toxic	Reverse osmosis scale inhibitor	Power Block and Common Area:  Containers in Water Treatment Building	900 gal	300 gallon totes

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Sodium Bisulfite	Irritant, mildly toxic	Dechlorination	Power Block and Common Area:  Containers in Water Treatment Building	900 gal	300 gallon totes
Nalco 7468 (Anti-foaming agent)	Irritant, mildly toxic	Wastewater treatment system anti-foaming agent	Power Block:  Containers near WWTS  Common Area:  Containers in Water Treatment Building (storage)	1,500 gal	300 gallon totes

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Lubricating Oil	Mildly toxic	Miscellaneous equipment lubrication	Power Block:  Contained within equipment, drums during replacement  Common Area:  Contained within equipment, spare capacity stored in Maintenance shop	30,000 gal	Contained within equipment and misc. drums during replacement

Hazardous Materials Usage and Storage During Operation Based on Material Properties					
Material	Hazard Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Mineral Transformer Insulating Oil	Mildly toxic	Provides overheating and insulation protection for transformers	Power Block:  Contained within transformers  Common Area:  Contained within transformers	112,000 gal	Transformers
Hydraulic Oil	Mildly toxic	Miscellaneous equipment control oil	Power Block:  Contained within equipment, drums during replacement  Common Area:  Contained within equipment, spare capacity stored in Warehouse	6,000 gal	Contained within equipment and misc. drums during replacement
Sodium Hypochlorite 12% (trade) solution	Irritant, Corrosivity, reactivity	Biocide	Power Block:  Containers in water treatment building  Common Area:  Potable water treatment area	2,400 gal	300 gal totes

(Ex. 2000, pp. 4.4-33 – 4.4-36.)

## **F. WASTE MANAGEMENT**

### **DESCRIPTION OF MODIFICATIONS**

The amended project Palen Solar Electric Generating System (PSEGS) will occupy the same location as the certified project (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The PSEGS eliminates the use of solar trough technology and replaces it with BrightSource's solar tower technology. The most relevant modifications are that the PSEGS eliminates the use, transportation and storage of millions of gallons of Therminol, the heat transfer fluid (HTF) utilized by the heliotrough technology. Management of the nonhazardous and hazardous waste generated during construction, operation, and closure of the Palen Solar Electric Generating Station (PSEGS) would not result in significant adverse impacts under the California Environmental Quality Act (CEQA) guidelines (**Appendix - G**: Environmental Checklist section XVI - Utilities and Service Systems). The PSEGS would be consistent with the applicable waste management laws, ordinances, regulations, and standards (LORS). (Ex. 2000, p. 4.13-1.)

The following evidence on Waste Management was received into evidence on October 29, 2013: Exhibits 1003, 1021, 1040, 1076, 2000, and 2008. (10/29/13 RT 38:8 – 38:22.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that Petitioner's Phase I Environmental Site Assessment (ESA) for the site and linear corridors did not identify any recognized environmental conditions (RECs) such as soil contaminated with hazardous materials. The project owner was required to implement appropriate characterization, disposal, and remediation measures to ensure that the potential risk of exposure to contaminated soils at the site or along the linear corridors is reduced to insignificant levels.

The PSPP Decision further found that due to the risks of potential exposure to unexploded ordnance (UXO) on and near the site, the project owner was required to implement an "Identification, Training, and Reporting Plan" to train site workers to avoid UXO, to conduct geophysical surveys for UXO, and to investigate, remove, and dispose of any UXO found on the site.

The decision also found that the PSPP would generate non-hazardous and hazardous wastes during excavation, construction, and operation. The Petitioner would be required to obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) and to recycle non-hazardous and hazardous wastes to the extent feasible and in compliance with applicable law. Any

hazardous wastes that could not be recycled were to be transported by registered hazardous waste transporters to appropriate Class I landfills.

As to solid non-hazardous wastes that could not be recycled, the decision placed conditions on the project so that they would be deposited at Class II and Class III landfills in the project vicinity, except that no project wastes may be deposited at the Oasis and Desert Center Landfills. Liquid wastes were to be classified for appropriate disposal and managed in accordance with the conditions of certification listed in the **SOIL AND WATER RESOURCES** section of this Decision.

The decision required the project owner to comply with regulatory requirements for managing accidental discharges of Heat Transfer Fluid (HTF) and ensure that hazardous HTF-contaminated soils are not discharged to the on-site land treatment unit.

As a result of the above, the PSPP Decision concluded that disposal of project wastes would not result in any significant direct, indirect, or cumulative impacts on existing waste disposal facilities. (PSPP Final Decision, CEC-800-2010-011, **WASTE MANAGEMENT**, pp. 9-10.)

## **THE AMENDED PROJECT'S IMPACTS**

### **Existing Project Site Conditions and Potential for Contamination**

Historical use of the PSEGS site included General George Patton's Desert Training Camps during World War II. The site is located near Palen Pass, which was the site of some of the largest mock battles in the California-Arizona Maneuver Area. Live-fire training occurred in camps and facilities in the area and conventional, unconventional, and improvised land mines have been detected in addition to unexploded ordinance (UXO). Due to the proximity of the PSEGS site to Palen Pass and the camps, the Petitioner plans to conduct pre-construction UXO surveys with qualified technicians that meet Department of Defense requirements and/or employ UXO experts during ground disturbances in areas that may contain UXO. The Petitioner also provided an outline for the "Munitions and Explosions of Concern/UXO Recognition Training Program." Existing Condition of Certification **WASTE-1** requires UXO training, investigation, removal, and disposal. (Ex. 2000, p. 4.13-8.)

A Phase I ESA dated May 2009 was prepared by AECOM in accordance with the American Society for Testing and Materials (ASTM) Standard Practice E 1527-05 for ESAs (Solar Millennium, 2009a). The 2009 ESA did not identify any Recognized Environmental Conditions (REC) in connection with historical or current site operations. An REC is the presence or likely presence of any hazardous substances or petroleum products on a property under the conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substance or petroleum

products into structures on the property, the ground, groundwater, or surface water. (Ex. 2000, p. 4.13-8.)

The environmental records-review portion of the 2009 ESA was updated on June 10, 2013. No changes in historical or current records were identified in this update. The ESA update was done in compliance with ASTM E 1527-05, which contains provisions for updating an existing ESA. (Ex. 2000, p. 4.13-8.)

In the event that contamination is identified during any phase of construction, existing Condition of Certification **WASTE-2** requires the availability of an experienced and qualified Professional Engineer or Professional Geologist for consultation. If contaminated soil is identified, existing Condition of Certification **WASTE-3** requires that the Professional Engineer or Professional Geologist inspect the site, determine what is required to characterize the nature and extent of contamination, and provide a report to the Energy Commission compliance project manager (CPM) and DTSC with findings and recommended actions. Condition of Certification **WASTE-3** also requires Phase I to be updated with a current on-site inspection for RECs. (Ex. 2000, p. 4.13-8.)

In the unlikely event that contaminated soil is encountered during excavation activities, the soil would be segregated, sampled, and tested to determine appropriate disposal and treatment options. If the soil is classified as hazardous, the Riverside County Department of Environmental Health would be notified and the soil hauled to a Class I landfill or other appropriate soil treatment and recycling facility, as required. The Riverside County Department of Environmental Health would also be notified if previously unknown wells, tanks, or other underground storage facilities were discovered during construction. Subsequent removal of such equipment, including potential remediation activities, would be conducted in accordance with applicable LORS (Solar Millennium, 2009a). Conditions of Certification **WASTE-2** and **WASTE-3** would be adequate to address any soil contamination contingency that may be encountered during construction of the project and would further support compliance with LORS. (Ex. 2000, pp. 4.13-8 - 4.13-9.)

### **Impacts from Generation and Management of Wastes During Project Construction, Operation, and Closure**

Handling and management of waste generated by PSEGS would follow the hierarchical approach of source reduction, recycling, treatment, and disposal as specified in California Public Resources Code, sections 40051 and 40196. The first priority of the project owner is to use materials that reduce the waste that is generated. The next level of waste management involves reusing or recycling wastes. For wastes that cannot be recycled, treatment is to be used, if possible, to make the waste nonhazardous. Finally,

waste that cannot be reused, recycled, or treated is to be transported off site to a permitted treatment, storage, or disposal facility. (Ex. 2000, p. 4.13-9.)

### **Direct/Indirect Impacts and Mitigation**

The Integrated Waste Management Act of 1989 set landfill waste diversion goals for local jurisdictions of 50 percent by the year 2000. To meet this goal, many jurisdictions require Petitioners for construction and demolition projects to submit a reuse/recycling plan for at least 50 percent of construction and demolition materials prior to the issuance of a building or demolition permit. While Riverside County does not have such a requirement, we encourage the project owner to meet the 50 percent waste diversion rate. (Ex. 2000, p. 4.13-9.)

### **Construction**

Site preparation and construction of PSEGS would last approximately 34 months and generate non-hazardous, universal, and hazardous wastes in solid and liquid forms. Based on estimates by the project owner, these waste streams and volumes generated by the modified project would be roughly the same as those of the original project. (Ex. 2000, p. 4.13-9.)

Wastewater would be generated during construction, and would include sanitary waste, hydrostatic test water, and equipment wash water. Sanitary waste would be contained in portable facilities and routinely disposed of at an off-site treatment/disposal facility by a sanitary service. Hydrostatic test water would be disposed of in accordance with State Water Resources Control Board (SWRCB) *Order No. 2003-003-DWQ Statewide General Waste Discharge Requirements (WDRs) for Discharges to Land with a Low Threat to Water Quality (General WDRs)*. Potentially contaminated equipment wash water would be contained at designated wash areas and transported to a wastewater treatment facility via a licensed hauler. Please see the **SOIL AND WATER RESOURCES** section of this document for more information about the management of project wastewater. (Ex. 2000, pp. 4.13-9 – 4.13-10.)

Universal waste generated during construction would include spent alkaline batteries and fluorescent and mercury vapor lamps. The spent batteries and lamps would be recycled or disposed of by licensed universal waste handlers. Universal waste would be accumulated for less than one year and recycled off site. Before construction begins, the project owner would be required to develop and implement a Construction Waste Management Plan to ensure that waste is recycled when possible and properly land filled as necessary. Existing Condition of Certification **WASTE-4** requires the project owner to submit a Construction Waste Management Plan to the CPM at least 30 days prior to the start of construction activities. (Ex. 2000, p. 4.13-10.)

Hazardous waste generated during construction would include empty hazardous material containers, solvents, used oil and lube, paint, adhesives, oily rags, oil sorbent, spent welding materials, spent lead-acid batteries, corrosive cleaning materials, and flushing and cleaning wash water. This hazardous construction waste does not differ significantly from that of the original project. Empty hazardous material containers would be returned to the vendor or disposed of at a hazardous waste facility. Spent lead-acid batteries, solvents, used oils and lube, paint, adhesives, oil sorbent, and oily rags would be disposed of at a hazardous waste facility, recycled, or used for energy recovery. Corrosive cleaning materials would be disposed of at a permitted hazardous waste disposal facility. Flushing and cleaning wash water would be recycled, used for energy recovery, or disposed of based on its specific waste stream characteristics. (Ex. 2000, p. 4.13-10.)

The generation of hazardous waste requires a unique hazardous-waste generator identification number. The hazardous-waste generator number is determined based on site location; therefore both the construction contractor and the PSEGS project owner/operator could be considered the generators of hazardous wastes at the site. The PSEGS project owner would be required to obtain a unique hazardous-waste generator identification number for the site prior to starting construction in compliance with California Code of Regulations, title 22, division 4.5. Existing Condition of Certification **WASTE-5** requires the PSEGS project owner to submit the notification and issued identification number documentation to the CPM prior to construction activity. (Ex. 2000, p. 4.13-10.)

Hazardous wastes would be collected in hazardous waste accumulation containers and stored in a lay-down area, warehouse area, or storage tank on equipment skids for less than 90 days (or less than 180 days in the case of lead acid batteries). The accumulated wastes would then be properly manifested, transported, and disposed of at a permitted hazardous waste disposal facility by a licensed hazardous waste collection and disposal firm. Based on the evidence, we find that all wastes would be disposed of in accordance with all applicable LORS. Should any construction-waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by existing Condition of Certification **WASTE-6** to notify the CPM whenever the owner becomes aware of such action. (Ex. 2000, p. 4.13-10.)

## Operation

The PSEGS would generate non-hazardous, universal, and hazardous wastes in solid and liquid forms under normal operating conditions. Based on estimates by the project owner, these waste streams and volumes generated by the modified project would be roughly the same as those of the original project. (Ex. 2000, p. 4.13-11.)

PSEGS would generate non-hazardous waste, such as routine maintenance wastes (used air filters, spent deionization resins, sand and filter media) and domestic and office wastes (office paper, newsprint, aluminum cans, plastic, and glass). All non-hazardous solid wastes would be recycled to the maximum extent possible and non-recyclable wastes would be regularly transported off site to a solid waste disposal facility. (Ex. 2000, p. 4.13-11.)

Non-hazardous liquid wastes would be generated during facility operation and would include reverse osmosis (RO) membrane cleaning waste, RO system concentrate, and sanitary wastewater. RO membrane cleaning waste would be adjusted to neutralize its pH and used as a dust suppressant on site or disposed of at a permitted waste management facility. Sanitary wastewater would be piped to an on-site septic system and leach field. RO system concentrate would be used for dust control if determined to be inert, or disposed of at a permitted waste management facility if determined to be designated waste. (Ex. 2000, p. 4.13-11.)

Project operations would also generate universal waste, including spent batteries (e.g., alkaline dry-cell, nickel-cadmium, or lithium-ion) and spent fluorescent bulbs or high-intensity discharge lamps. Universal waste would be accumulated for less than one year and recycled off site. In accordance with existing Condition of Certification **WASTE-7**, the project owner would be required to develop and implement an Operations Waste Management Plan that would require documentation of the actual operational waste streams and waste volumes. The measures in the Operations Waste Management Plan would ensure that operational wastes are treated in compliance with all LORS and that an accurate record of PSEGS waste generation, storage, and disposal practices is maintained. (Ex. 2000, p. 4.13-11.)

Hazardous wastes generated during project operations would include used lubricating oil and oil filters, solvents, paint, adhesives, oily rags, and oil sorbents. Used oils and grease would be recycled. Effluent from the oil-water separation system would be recycled. Oil adsorbent and oil filters would be sent off site for recovery or disposal at a Class I landfill. No HTF-related wastes would be generated. Therefore, Condition of Certification **WASTE-8** is no longer required. (Ex. 2000, p. 4.13-11.)

The PSEGS project owner would be considered the generator of hazardous wastes during facility operations. The hazardous waste generated identification number that

would be required before the start of construction would be the same identification number used during project operations as required by existing Condition of Certification **WASTE-5**. (Ex. 2000, p. 4.13-11.)

Proper hazardous material handling, good housekeeping practices, and personnel training would help keep spill wastes to a minimum. To ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, existing Condition of Certification **WASTE-9** requires the project operator to document, clean up, and properly manage and dispose of wastes from any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information related to hazardous materials management is provided in the **HAZARDOUS MATERIALS MANAGEMENT** section of this document. (Ex. 2000, p. 4.13-12.)

The hazardous wastes generated during proposed modified project operations would be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed of at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Cal. Code Regs., tit. 22, §66262.10 et seq.). Should any operations waste-management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by existing Condition of Certification **WASTE-6** to notify the CPM when advised of any such action. (Ex. 2000, p. 4.13-12.)

### **Closure**

The closure of the PSEGS would produce both hazardous and non-hazardous solid and liquid waste. The project owner did not identify waste streams or quantities of materials requiring disposal from closure. Required elements of a facility's non-operation and closure are outlined in a repair/restoration plan and facility closure plan as specified in proposed Conditions of Certification **COMPLIANCE-14** and **COMPLIANCE-15**. To ensure adequate review of a planned project closure, the PSEGS project owner would be required to submit a proposed facility closure plan to the CPM for review and approval at least 36 months (or other period of time agreed to by the CPM) prior to commencement of closure activities. The facility closure plan would document non-hazardous and hazardous waste management practices, including the inventory, management, and disposal of hazardous materials and wastes and permanent disposal of permitted hazardous materials and waste storage units. In addition, the plan would identify landfills with adequate capacity to receive closure-generated wastes. Conditions of Certification **WASTE-1** through **WASTE-10**, excluding **WASTE-8**, would apply to the proposed modified project during closure of PSEGS. (Ex. 2000, p. 4.13-12.)

## Impact on Existing Waste Disposal Facilities

The PSEGS project owner estimated the operational non-hazardous waste volume would be 335 tons per year (approximately 1,500 cubic yards over 30 years). These volumes of non-hazardous and hazardous waste do not differ significantly from that of the PSPP project, except that no HTF would be used and no HTF-related wastes would be generated. (Ex. 2000, p. 4.13-13.)

Non-hazardous waste would be stored on site in appropriate containers and be recycled or disposed of in a Class III landfill on a regular basis. As shown in **Waste Management - Table 1**, there are six Class III waste disposal facilities in Riverside County that could potentially accommodate the PSEGS non-hazardous construction and operation wastes project: Badlands; Blythe; Desert Center; Lamb Canyon; Mecca II; and Oasis (CalRecycle, 2013). (Ex. 2000, p. 4.13-13.)

**Waste Management - Table 1  
Riverside County Landfill Capacity**

Landfill	Permitted Days of Operation	Remaining Capacity (cubic yards)
Badlands	Mon - Sat, closed holidays	14,730,025
Blythe	Mon - Fri and first Sat of the month, closed holidays	4,159,388
Desert Center	2 days per year, closed holidays	23,246
Lamb Canyon	Mon - Sat, closed holidays	18,955,000
Mecca II	2 days per year, closed holidays	34,786
Oasis	Every Weds and Sat, closed holidays	149,597
<b>Total</b>		<b>38,052,042</b>

Sources: CalRecycle, 2013; RCoWMD, 2013. (Ex. 2000, p. 4.13-13.)

The combined remaining capacity of these six landfills is approximately 38 million cubic yards (CalRecycle, 2013). The non-recyclable, non-reusable component of the PSEGS waste stream would contribute to filling the available capacity of these landfills and would contribute a substantial portion of the remaining capacity at the Desert Center and Mecca II landfills. The remaining capacity of Desert Center and Mecca II landfills is limited to 34,786 cubic yards and 23,246 cubic yards, respectively. In addition, the days of operation of these two landfills are very limited. Therefore, existing Condition of Certification **WASTE-10** requires that all project-related non-hazardous, non-recyclable, and non-reusable construction and operation waste be diverted to Riverside County landfills other than Desert Center and Mecca II. Disposal of the non-hazardous solid wastes generated by the proposed modified project could occur without impacting the capacity or remaining life of the other Class III facilities. (Ex. 2000, p. 4.13-13.)

There are two Class I waste disposal facilities in California that are currently accepting hazardous waste: Clean Harbors Buttonwillow Landfill in Kern County, and the

Chemical Waste Management Kettleman Hills Landfill in Kings County. In total, there is a combined excess of 10 million cubic yards of remaining hazardous waste disposal capacity at these landfills with at least 30 remaining operating years. In addition, the Kettleman Hills facility is in the process of permitting an additional 4.6 to 4.9 million cubic yards of disposal capacity. Hazardous wastes generated during construction, operation, and closure would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility. (Ex. 2000, pp. 4.13-13 – 4.13-14.)

As noted above, the type and quantity of waste for non-operation and closure have not been identified. The repair/restoration plan and facility closure plan, prepared pursuant to Conditions of Certification **COMPLIANCE-14** and **COMPLIANCE-15**, would provide this information as well as disposal facilities with adequate capacity to receive the wastes. (Ex. 2000, p. 4.13-14.)

### **CUMULATIVE IMPACTS**

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130). NEPA states that cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." (40 CFR §1508.7.) (Ex. 2000, p. 4.13-14.)

As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of PSEGS would add to the total quantity of waste generated in Riverside County. Project non-hazardous wastes would be generated in modest quantities, approximately 2,135 cubic yards of solid waste during construction and 69 cubic yards per year during operation. These wastes would be recycled wherever practical and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. The four available Class III landfills listed in **Waste Management - Table 1** have a remaining capacity of approximately 38 million cubic yards. (Ex. 2000, p. 4.13-14.)

Approximately 153 cubic yards of construction hazardous waste and 72 cubic yards per year of operation hazardous waste would be generated by PSEGS. California Class I landfills have over 15 million cubic yards of remaining capacity for hazardous waste. There is sufficient landfill capacity for hazardous waste in Riverside County. (Ex. 2000, p. 4.13-14.)

The amount of non-hazardous and hazardous wastes, generated during construction, operation, and closure of PSEGS, would add to the total quantity of hazardous and non-

hazardous waste generated in Riverside County. Projects in Riverside County would recycle waste wherever practical and sufficient landfill capacity is available throughout the area, especially with the addition of the Mesquite Regional Landfill with a capacity of 600 million tons when it is fully constructed. As part of the County of Riverside AB 939 planning and reporting requirements, the County estimates that the existing County waste disposal system provides approximately 59.3 million tons of permitted disposal capacity (as of 12/31/2006), which would provide more than 15 years of the County's disposal capacity. Therefore, impacts of PSEGS, when combined with impacts of other development projects currently proposed within Riverside County, would not result in significant adverse cumulative impacts under CEQA. We therefore find that the waste generated by PSEGS would not result in local or regional significant waste management impacts that would be cumulatively considerable with implementation of Condition of Certification **WASTE-10**, which diverts project wastes to Riverside County landfills with adequate capacity. (Ex. 2000, p. 4.13-14.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant LORS applicable to waste management are contained in **Appendix - A** of this decision. We conclude that the PSEGS project would comply with all applicable LORS regulating the management of non-hazardous and hazardous wastes during facility construction and operation. The project owner would be required to recycle and/or dispose of non-hazardous and hazardous wastes at facilities licensed or otherwise approved to accept the wastes. Because hazardous wastes would be produced during project construction and operation, PSEGS would be required to obtain a hazardous waste generator identification number from USEPA. PSEGS would also be required to:

- properly store, package, and label all hazardous waste;
- use only approved transporters;
- prepare hazardous waste manifests;
- keep detailed records; and
- appropriately train employees in accordance with state and federal hazardous waste management requirements. (Ex. 2000, p. 4.13-15.)

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the

original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Throughout this decision, we describe various benefits that will accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. The PSEGS site is designated “Developable” in the BLM’s Eastern Riverside County Solar Energy Zone. In addition, as described in this decision, power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the parabolic technology. Furthermore, the PSEGS project would use less hazardous materials than the approved project in that solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion. (Ex. 1003, pp. 1-2– 1-3.)

## **PUBLIC COMMENT**

There were no comments received from the public regarding the Waste Management.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. Applicant’s Phase I Environmental Site Assessment (ESA) for the site and linear corridors did not identify any recognized environmental conditions (RECs) such as soils contaminated with hazardous materials.
2. The project owner will implement appropriate characterization, disposal, and remediation measures to ensure that the potential risk of exposure to contaminated soils at the site or along the linear corridors is reduced to insignificant levels.
3. To reduce the risks of potential exposure to unexploded ordnance (UXO) on and near the site, the project owner will implement an “Identification, Training, and Reporting Plan” to train site workers to avoid UXO, to conduct geophysical surveys for UXO, and to investigate, remove, and dispose of any UXO found on the site.
4. The project will generate non-hazardous and hazardous wastes during excavation, construction, and operation.
5. The project will obtain a hazardous waste generator identification number from the United States Environmental Protection Agency.

6. The project will recycle non-hazardous and hazardous wastes to the extent feasible and in compliance with applicable law.
7. Hazardous wastes that cannot be recycled will be transported by registered hazardous waste transporters to appropriate Class I landfills.
8. Solid non-hazardous wastes that cannot be recycled will be deposited at Class II and III landfills in the project vicinity, except that no project wastes may be deposited at the Mecca II and Desert Center Landfills.
9. Liquid wastes will be classified for appropriate disposal and managed in accordance with the conditions of certification listed in the **SOIL AND WATER RESOURCES** section of this decision.
10. Disposal of project wastes will not result in any significant direct, indirect, or cumulative impacts on existing waste disposal facilities.
11. As we found in ALTERNATIVES, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. PSEGS is described at a level of detail sufficient to allow review in compliance with the provisions of both the Warren-Alquist Act and the California Environmental Quality Act.
2. The change in the project will be beneficial to the public, Petitioner, and intervenors. The PSEGS site is designated “Developable” in the BLM’s Eastern Riverside County Solar Energy Zone. The power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the PSPP’s parabolic trough technology. Furthermore, the PSEGS project will use less hazardous materials than the PSPP project and the solar tower technology avoids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion.
3. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process because at the time of the original licensing, the project was wholly-owned by Solar Millennium, whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission’s Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

**WASTE-1** The project owner shall prepare a Unexploded Ordnance (UXO) Identification, Training and Reporting Plan to properly train all site workers in the recognition, avoidance and reporting of military waste debris and ordnance. The project owner shall submit the plan to the CPM for review and approval prior to the start of construction. The project owner shall provide documentation of the plan and provide survey results to the CPM. The plan shall contain, at a minimum, the following:

1. A description of the training program outline and materials, and the qualifications of the trainers;
2. Identification of available trained experts who will oversee earth-moving activities where ordnance could be uncovered and respond to notification of discovery of any ordnance (unexploded or not); and
3. Work plan to identify, recover, and remove discovered ordnance, and to complete additional field screening, including geophysical surveys to investigate adjacent areas for surface, near surface or buried ordnance in all proposed land disturbance areas.

**VERIFICATION:** The project owner shall submit the UXO Identification, Training and Reporting Plan to the CPM for approval no later than 30 days prior to the start of site mobilization. The results of geophysical surveys shall be submitted to the CPM within 30 days of completion of the surveys.

**WASTE-2** The project owner shall provide the resume of an experienced and qualified Professional Engineer or Professional Geologist to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies. This Professional Engineer or Professional Geologist shall be available during site characterization (if needed), excavation, grading, and demolition activities. The Professional Engineer or Professional Geologist shall be given authority by the project owner to oversee any earth-moving activities that have the potential to disturb contaminated soil and impact public health, safety, and the environment.

**VERIFICATION:** No later than 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

**WASTE-3** If potentially contaminated soil is identified during site characterization, excavation, grading, or demolition at either the proposed site or linear facilities—as evidenced by discoloration, odor, detection by handheld

instruments, or other signs—the Professional Engineer or Professional Geologist shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and provide a written report to the project owner, representatives of Department of Toxic Substances Control (DTSC) or Regional Water Quality Control Board (RWQCB), and the CPM stating the recommended course of action.

Depending on the nature and extent of contamination, the Professional Engineer or Professional Geologist shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the Professional Engineer or Professional Geologist, significant remediation may be required, the project owner shall contact the CPM and representatives of the DTSC or RWQCB for guidance and possible oversight.

**VERIFICATION:** The project owner shall submit any reports filed by the Professional Engineer or Professional Geologist to the CPM within 5 days of their receipt. The project owner shall notify the CPM within 24 hours of any orders issued to halt construction.

**WASTE-4** The project owner shall submit a Construction Waste Management Plan to the CPM for review and approval prior to the start of construction. The plan shall contain, at a minimum, the following:

1. a description of all construction waste streams, including projections of frequency, amounts generated and hazard classifications;
2. a survey of structures to be demolished that identifies the types of waste to be managed;
3. a reuse/recycling plan for construction and demolition materials that meets or exceeds the 50 percent waste diversion goal established by the Integrated Waste Management Compliance Act; and,
4. management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods, and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

**VERIFICATION:** The project owner shall submit the Construction Waste Management Plan to the CPM for approval no later than 30 days prior to the initiation of construction activities at the site.

**WASTE-5** The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.

**VERIFICATION:** The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled monthly compliance report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

**WASTE-6** Upon notification of any impending waste management-related enforcement action related to project site activities by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts for the project, and describe the owner's response to the impending action or if a violation has been found, how the violation will be corrected.

**VERIFICATION:** The project owner shall notify the CPM in writing within 10 days of receiving written notice from authorities of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed as a result of a finalized action against the project.

**WASTE-7** The project owner shall submit the Operation Waste Management Plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

1. a detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
2. management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to ensure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;

3. information and summary records of contacts with the local Certified Unified Program Agency and the DTSC regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
4. a detailed description of how facility wastes will be managed and any contingency plans to be employed, in the event of an unplanned closure or planned temporary facility closure; and
5. a detailed description of how facility wastes will be managed and disposed upon closure of the facility.

**VERIFICATION:** The project owner shall submit the Operation Waste Management Plan to the CPM for approval no later than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each annual compliance report the actual volume of wastes generated and the waste management methods used during the year, provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan, and update the Operation Waste Management Plan as necessary to address current waste generation and management practices.

**WASTE-8 DELETED**

**WASTE-9** The project owner shall ensure that all accidental spills or unauthorized releases of hazardous substances, hazardous materials, and hazardous wastes are documented and remediated, and that wastes generated from accidental spills and unauthorized releases are properly managed and disposed of in accordance with all applicable federal, state, and local LORS and requirements. For the purpose of this condition of certification, “release” shall have the definition in title 40 of the Code of Federal Regulations, part 302.3.

**VERIFICATION:** No later than 30 days from the date that a project-related hazardous substance release was discovered, the project manager shall provide a copy of the accidental spill or unauthorized release documentation to the CPM.

The project owner shall document management of all accidental spills and unauthorized releases of hazardous substances, hazardous materials, and hazardous wastes that occur on the project property or related linear facilities. The documentation shall include, at a minimum, the following information: location of release; date and time of release;

reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release.

**WASTE-10** The project owner shall ensure that none of the project's non-hazardous, non-recyclable, and non-reusable construction and operation wastes shall be diverted to or deposited at either the Desert Center Landfill or the Mecca II Landfill.

**VERIFICATION:** The project owner shall provide documentation of all project-related solid waste disposal activities and identify the landfills receiving project-related wastes in the annual compliance report submitted to the CPM.

## VI. ENVIRONMENTAL ASSESSMENT

### A. BIOLOGICAL RESOURCES

#### DESCRIPTION OF MODIFICATIONS

The project changes contained in the Palen Solar Electric Generating System (PSEGS) amendment included two 250-MW power-generating units, each consisting of a dedicated field of approximately 85,000 heliostats, a 750-foot solar tower and receiver, and a power block. The project would include an approximately 15-acre common facilities area located in the southwestern corner of the site, with an administrative/warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the Palen Solar Power Plant (PSPP)). During construction, PSEGS would utilize an approximately 203-acre lay-down area located in the southwestern portion of the site immediately north of the common facilities area. The amendment includes re-routing of the generation tie-line near the western end of the route and around the Red Bluff Substation currently under construction. PSEGS will receive natural gas delivery from a new extension of the existing Southern California Gas (SoCal Gas) distribution system to the project boundary. There will be no need to relocate the existing Southern California Edison 161-kV power line. (Ex. 2000, pp. 4.2-20 - 4.2-21.)

During construction, portions of the PSEGS site will be graded, including portions along the ephemeral washes. Grading is not intended to level the site, but rather to prepare the site for installation of the heliostats and ease future maintenance activities. As such, the drainages will remain intact, to the extent feasible, and natural drainage waters are expected to continue to flow in and through these ephemeral washes. Any grading required is designed to maintain existing drainage pathways where possible. Approximately 27 percent of the site will be completely developed and the rest of the site will be left largely intact. (Ex. 2000, p. 4.2-21.)

The PSEGS will use natural gas to fire its auxiliary and nighttime preservation boilers. The natural gas supply for PSEGS will be provided by SoCal Gas via a new pipeline that would extend southward from the site and interconnect with an existing SoCal Gas transmission pipeline located just south of Interstate I-10 (I-10). The new gas pipeline, approximately eight inches in diameter and 2,956 feet long, would disturb an approximately 50-foot-wide corridor that would be approximately 3,000 feet long and encompass 3.3 acres. The proposed natural gas line distribution disturbance area encompasses approximately 0.23 acres. (Ex. 2000, p. 4.2-22.)

As noted in the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision, we would require at least two emergency access gates, one each on the north fence

line and south fence line. If there were an emergency and the main access road was blocked, all-terrain fire engines would be able to access the site through these gates. (Ex. 2000, p. 4.2-22.)

The following exhibits on biological resources were received into evidence on October 29, 2013: Exhibits 1003, 1004, 1005, 1006, 1010, 1012, 1013, 1014, 1019, 1021, 1022, 1026, 1027, 1032, 1035, 1036, 1037, 1038, 1040, 1041, 1047, 1048, 1049, 1050, 1057, 1058, 1059, 1060, 1061, 1062, 1068, 1070, 1071, 1072, 1075, 1077, 1078, 1080, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 2000, 2003, 2005, 2008, 3000 through 3050, and 3052 through 3064. (10/29/13 RT 224:4 – 227:9.) The following exhibits on biological resources were received into evidence on July 30, 2014: Exhibits 1127 through 1141, 1153 through 1165, 1170, 1173 through 1178, 1182, 1186, 1188, 1194 through 1205, 2017, 2018, 2019, 2029, 2034, 3092 through 3112, 3126 through 3145, 3150, 3151, and 8035. (7/30/14 RT 447:1 – 454:25.)

## **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The approved PSPP was a concentrated solar thermal parabolic trough electric power generating facility with two adjacent independent and identical solar plants of 250-megawatt (MW) nominal capacity each, for a total nominal capacity of 500 MW. The final Energy Commission Decision certifying the PSPP project found that with the implementation of the conditions of certification, the PSPP project would comply with all applicable LORS and would not result in any unmitigated and significant direct, indirect or cumulative adverse impacts to biological resources. (PSPP Final Decision, CEC-800-2010-011, **BIOLOGICAL RESOURCES**, pp. 55 – 58.)

The Decision analyzed three alternative sites varying in size from 4,024 to 4,366 acres including the power plant site, access roads, and an associated off-site transmission line corridor. The study area for the PSPP was approximately 13,715 acres, encompassing the Project Disturbance Area (including the transmission Disturbance Area) for the PSPP. The disturbance areas consisted almost entirely of native habitats, including desert dry wash woodland, unvegetated ephemeral dry wash, Sonoran creosote bush scrub, and stabilized and partially stabilized desert dunes. Electricity produced by the PSPP was to be distributed via a new transmission line that would extend south across I-10 and connect to one of two potential sites identified for the planned Red Bluff Substation, which had yet to be constructed by Southern California Edison. Twenty-three special status species were detected during Project Study Area surveys, including eight plant species, two reptile species (including the Desert Tortoise and Mojave Fringe-Toed Lizard [MFTL]), 10 bird species, and three mammal species. (PSPP Final Decision, CEC-800-2010-011, **BIOLOGICAL RESOURCES**, pp. 55 – 58.)

The Decision determined that construction and operation of the PSPP project would result in potentially significant direct and/or indirect impacts to biological resources, including waters of the state, wildlife connectivity, sand transport corridors and related landforms (e.g., dunes), sensitive plant communities, special-status plant and wildlife species, and other native vegetation. However, all impacts were found to be mitigated to below significance with the implementation of conditions of certification. Specifically, Condition of Certification **BIO-21** would reduce direct and indirect impacts to waters of the state to below a level of significance. **BIO-9** would reduce direct and indirect impacts to wildlife connectivity to below a level of significance. **BIO-20** addressed direct impacts to sand dune habitats, although indirect (downwind) impacts from the PSPP project would remain significant and unmitigated due to related sand shadow effects to the Palen Dry Lake-Chuckwalla sand transport corridor under **Alternative 1**, these indirect impacts would be reduced to below a level of significance under Reconfigured **Alternatives 2 or 3**, which the project owner elected to pursue. **BIO-23** and **BIO-24** were found to reduce potential impacts to groundwater dependent ecosystems to below a level of significance, and **BIO-1 - BIO-14** and **BIO-28** reduced all direct and indirect impacts to the Desert Tortoise to below significance. Condition of Certification **BIO-20** was found to reduce all direct and indirect impacts to the MFTL to below significance. Direct and indirect impacts to the Western Burrowing Owl were reduced to below a level of significance with the mitigation contained in **BIO-18**. **BIO-12**, **BIO-14**, **BIO-21**, and **BIO-25** reduced direct and indirect impacts to the Golden Eagle and **BIO-8**, **BIO-12**, **BIO-15**, **BIO-16**, and **BIO-20** reduced direct and indirect impacts to migratory birds and special-status bird species to below significance. The Decision found that **BIO-12** and **BIO-17** reduced direct and indirect impacts to the American Badger and desert Kit Fox to below a level of significance.

**BIO-8**, **BIO-14**, **BIO-19**, and **BIO-20 - BIO-24** were found to reduce direct and indirect impacts to special-status plant species and native (but non special-status) cacti, succulents, and trees to below a level of significance. Conditions of Certification **BIO-8**, **BIO-16**, and **BIO-26** would reduce indirect impacts to biological resources associated with construction noise, lighting, nocturnal collisions, electrocution, and evaporation ponds to below significance. **BIO-22** would reduce direct and indirect impacts related to decommissioning of the PSPP project to below a level of significance. After implementation of these conditions, the PSPP Decision determined that the project would not contribute to cumulatively considerable impacts in combination with other identified projects. (PSPP Final Decision, CEC-800-2010-011, **BIOLOGICAL RESOURCES** section, pp. 55 – 58.)

## THE AMENDED PROJECT'S IMPACTS AND MITIGATION

The Final Staff Assessment (FSA) of the PSEGS (Exhibit 2000) describes in detail the site's current setting and existing conditions regarding the project's regional setting, vegetation, and wildlife. The analysis in evidence describes the natural communities including the Sonoran creosote bush scrub, dry lake beds, desert dry wash woodland, ephemeral desert washes, waters of the state, desert sink scrub, desert sand dunes, and groundwater dependent vegetation communities, including mesquite bosque, microphyll woodlands, bush seep-weed and other alkali sink scrubs. The analysis in evidence fully describes the sand dune transport system. The description of the current setting and conditions also describes non natural conditions at the site including agriculture and noxious weeds found at or near the site, including Sahara mustard, Russian thistle, tamarisk (or salt cedar), and Mediterranean grass. The site's current setting and existing conditions remain unchanged from the PSPP analysis. **Biological Resources - Table 1** below describes the acreage covered by natural communities and cover type within the biological resources study area. (Ex. 2000, p. 4.2-22 – 4.9-38.)

**Biological Resources - Table 1  
Natural Communities and Cover Types**

Natural Communities and Cover Type within the Biological Resources Study Area	PSEGS Project Disturbance Area <sup>1</sup>	PSPP Biological Resources Study Area <sup>2</sup>
<b>Riparian</b>		
Desert dry wash woodland	206	846
Unvegetated ephemeral dry wash	168	225
<i>Subtotal Riparian</i>	<i>374</i>	<i>1,071</i>
<b>Upland</b>		
Active desert dunes	0	684
Desert sink scrub	0	9
Dry lake bed	0	270
Sonoran creosote bush scrub	3335	10,845
Stabilized and partially stabilized desert dunes	186	910
<i>Subtotal Upland</i>	<i>3,522</i>	<i>12,718</i>
<b>Other Cover Types</b>		
Agricultural Land	0	833
Developed	2	149
<i>Subtotal Other Cover Types</i>	<i>2</i>	<i>982</i>
<b>Total Acres</b>	<b>3,899</b>	<b>14,771</b>

**Source:** (Ex. 2000, p. 25).

1 – The Project Disturbance Area encompasses the disturbance resulting from the proposed construction of the PSEGS project including solar fields, transmission facilities, office and maintenance buildings, lay down area, bioremediation area, drainage channels, leach fields, and other components. It includes the impact acreage of the permitted generation-tie line for the Red Bluff Substation. These acreages include final data for the 18.9 acre proposed generation-tie line route included in the Final Comments on the Preliminary Staff Assessment.

2 – The Biological Resources Study Area encompasses the Project Disturbance Area (area inside and outside the facility fence that will be disturbed by the project), the solar facility footprint area inside the facility fence including solar fields and other support structures and facilities, the transmission line route and buffer areas (1 mile for solar footprint, 1,000 feet for the transmission line) for the PSPP project. All features for the PSEGS except the proposed generation tie-line route are included in the PSPP Project Disturbance Area.

The FSA identifies the plant and animal species found at the site and describes the special status species in detail (see **Biological Resources - Table 2** below). Specifically, the FSA describes the following special status plant species: Harwood’s milkvetch; Ribbed cryptantha; Harwood’s eriastrum; Utah vining milkweed; California ditaxis; Atriplex sp. Nov; Desert Unicorn plant; Abram’s spurge; Flat-seeded spurge; lobed ground cherry; dwarf germander; Palmer’s jackass clover; jackass clover; winged cryptantha; and Las Animas colubrine. (Ex. 2000, p. 4.2-38 – 4.9-54.)

The FSA also further describes in detail the following special status wildlife species and associated critical habitat: special status insects; MFTL; Couch's Spadefoot Toad; Desert Tortoise; Western Burrowing Owl; Golden Eagle; Loggerhead Shrike; Le Conte's Thrasher; California Horned Lark; Prairie Falcon; Elf Owl; Gila Woodpecker; American Badger; Desert Kit Fox; Nelson's Bighorn Sheep; Burro Deer; and bats, including the California Leaf-nosed Bat, Pallid Bat, Western Mastiff Bat, Cave Myotis, and the Western Yellow Bat. (Ex. 2000, p. 4.2-54 – 4.9-54.)

**Biological Resources - Table 2  
Special-Status Species Known to or With Potential to Occur in the Palen Solar  
Electric Generating System Biological Resources Study Area**

PLANTS		
Common Name	Scientific Name	Status State/Fed/CNPS/the BLM/ Global Rank/State Rank
Chaparral sand verbena	<i>Abronia villosa var. aurita</i>	__/_/1B.1/Sensitive/G5T3T4/S2
Angel trumpets	<i>Acleisanthes longiflora</i>	__/_/2.3/__/G5/S1
Desert sand parsley	<i>Ammoselinum giganteum</i>	__/_/2.3/__/G2G3/SH
Small-flowered androstephium	<i>Androstephium breviflorum</i>	__/_/2.2/__/G5/S2S3
<b>Harwood's milkvetch</b>	<b><i>Astragalus insularis var. harwoodii</i></b>	<b>__/_/2.2/__/G5T3/S2</b>
<b>Coachella Valley milkvetch</b>	<b><i>Astragalus lentiginosus var. coachellae</i></b>	<b>__/_/FE/1B.2./Sensitive/G5T2/S2</b>
<b>California ayenia</b>	<b><i>Ayenia compacta</i></b>	<b>SE/__/2.3/__/G4/S3?</b>
Pink fairy duster	<i>Calliandra eriophylla</i>	__/_/2.3/__/G5/S2S3
Sand evening-primrose	<i>Camissonia arenaria</i>	__/_/2.2/__/G4?/S2
Crucifixion thorn	<i>Castela emoryi</i>	__/_/2.3/__/G3/S2S3
Abram's spurge	<i>Chamaesyce abramsiana</i>	__/_/2.2/__/G4/S2S3
Arizona spurge	<i>Chamaesyce arizonica</i>	SR/__/2.3/__/G5/S2
<b>Flat-seeded spurge</b>	<b><i>Chamaesyce platysperma</i></b>	<b>__/_/1B.2/ Sensitive/G3/S1</b>
Las Animas colubrina	<i>Colubrina californica</i>	__/_/2.3/__/G4/S2S3.3
Spiny abrojo/Bitter snakeweed	<i>Condalia globosa var. pubescens</i>	__/_/4.2/__/G5T3T4/S3.2
Foxtail cactus	<i>Coryphantha alversonii</i>	__/_/4.3/__/G3/S3.2
<b>Ribbed cryptantha</b>	<b><i>Cryptantha costata</i></b>	<b>__/_/4.3/__/G4G5/S3.3</b>
Winged cryptantha	<i>Cryptantha holoptera</i>	__/_/4.3/__/G3G4/S3?
Wiggins' cholla	<i>Cylindropuntia wigginsii (syn=Opuntia wigginsii)</i>	__/_/3.3/__/G3?Q/S1
Utah vining milkweed	<i>Cynanchum utahense</i>	__/_/4.2/__/G4/S3.2
Glandular ditaxis	<i>Ditaxis claryana</i>	__/_/2.2/__/G4G5/S1
<b>California ditaxis</b>	<b><i>Ditaxis serrata var. californica</i></b>	<b>__/_/3.2/__/G5T2T3/S2</b>
<b>Cottontop cactus</b>	<b><i>Echinocactus polycephalus var. polycephalus</i></b>	<b>__/_/__/__/__/__/__</b>
<b>Harwood's eriastrum</b>	<b><i>Eriastrum harwoodii</i></b>	<b>__/_/1B.2/</b>

PLANTS		
Common Name	Scientific Name	Status State/Fed/CNPS/the BLM/ Global Rank/State Rank
		<b>Sensitive/G2/S3</b>
Morning-glory heliotrope	<i>Heliotropium convolvulaceum</i>	_/_/_/_/_/
California satintail	<i>Imperata brevifolia</i>	_/_/2.1_/G2/S2.1
Pink velvet mallow	<i>Horsfordia alata</i>	_/_/4.3/_/G4/S3.3
Bitter hymenoxys	<i>Hymenoxys odorata</i>	_/_/2.1/_/G5/S2
Spearleaf	<i>Matelea parvifolia</i>	_/_/2.3/_/G5?/S2.2
Darlington'sblazing star	<i>Mentzelia puberula</i>	_/_/2.2/_/G4/S2
Slender woolly-heads	<i>Nemacaulis denudata var. gracilis</i>	_/_/2.2/_/G3G4T3?/S2
Lobed ground cherry	<i>Physalis lobata</i>	_/_/2.3/_/G5/S2
Desert portulaca	<i>Portulaca halimoides</i>	_/_/4.2/_/G5/S3
Desert unicorn plant	<i>Proboscidea althaeifolia</i>	_/_/4.3/_/G5/S3.3
<b>Orocopia sage</b>	<b><i>Salvia greatae</i></b>	<b>_/_/1B.3./Sensitive/G2/S 2</b>
Desert spikemoss	<i>Selaginella eremophila</i>	_/_/2.2./_/G4/S2.2?
Cove's cassia	<i>Senna covesii</i>	_/_/2.2/_/G5?/S2
Mesquite nest straw	<i>Stylocline sonorensis</i>	_/_/1A/_/G3G5/SX
Dwarf germander	<i>Teucrium cubense ssp. depressum</i>	_/_/2.2/_/G4G5T3T4/S2
Jackass clover	<i>Wislizenia refracta ssp. refracta</i>	_/_/2.2/_/G5T5?/S1
Palmer's jackass clover	<i>Wislizenia refracta ssp. palmeri</i>	_/_/2.2/_/G5T2T4/S1
<b>"Palen Lake atriplex"</b> <sup>1</sup>	<b><i>Atriplex sp. nov. J. Andre (Atriplex canescens ssp?)</i></b>	<b>_/_/_/Sensitive/_/</b>

WILDLIFE		
Common Name	Scientific Name	Status State/Federal/the BLM
<b>Reptiles/Amphibians</b>		
Desert tortoise	<i>Gopherus agassizii</i>	ST/FT/
Couch's spadefoot toad	<i>Scaphiopus couchii</i>	CSC/_/Sensitive
MFTL	<i>Uma scoparia</i>	CSC//Sensitive
<b>Birds and bat species</b>		
Eared grebe**±	<i>Podiceps nigricollis</i>	_/_/
Black vulture	<i>Coragyps atratus</i>	_/_/
Turkey vulture**	<i>Cathartes aura</i>	_/_/
Northern harrier	<i>Circus cyaneus</i>	SSC/_/
<b>Swainson's hawk**</b>	<b><i>Buteo swainsoni</i></b>	<b>ST/_/</b>
Ferruginous hawk**	<i>Buteo regalis</i>	WL/BCC/S
Red-tailed hawk**	<i>Buteo jamaicensis</i>	_/_/

<sup>1</sup> Proposed new taxon (Andre, pers. comm.). BLM may consider proposed new taxa as BLM sensitive. (Lund, pers. comm.)

WILDLIFE		
Common Name	Scientific Name	Status State/Federal/the BLM
<b>Golden eagle</b>	<b><i>Aquila chrysaetos</i></b>	<b>FP/BCC/S</b>
<b>Bald eagle</b>	<b><i>Haliaeetus leucocephalus</i></b>	<b>SSC, FP/ BCC /S</b>
American kestrel**	<i>Falco sparvius</i>	_/_/_
Prairie falcon**	<i>Falco mexicanus</i>	WL/BCC/_
American peregrine falcon	<i>Falco peregrinus anatum</i>	FP/BCC/_
Gambel's quail**	<i>Callipepla gambelii</i>	_/_/_
<b>Yuma clapper rail</b>	<b><i>Rallus longirostris yumanensis</i></b>	<b>FP, T/E/_</b>
Vaux's swift	<i>Chaetura vauxi</i>	SSC/_/_
Killdeer**	<i>Charadrius vociferus</i>	_/_/_
<b>Mountain plover</b>	<b><i>Charadrius montanus</i></b>	<b>SSC/BCC/S</b>
White-winged dove**	<i>Zenaida asiatica</i>	_/_/_
Mourning dove**	<i>Zenaida macroura</i>	_/_/_
Greater roadrunner**	<i>Geococcyx californianus</i>	_/_/_
Barn owl**	<i>Tyto alba</i>	_/_/_
<b>Western burrowing owl</b>	<b><i>Athene cunicularia hypugaea</i></b>	<b>SSC/BCC/S</b>
Short-eared owl	<i>Asio flammeus</i>	SSC/_/_
Lesser nighthawk**	<i>Chordeiles acutipennis</i>	_/_/_
Great horned owl	<i>Bubo virginianus</i>	_/_/_
Long-eared owl	<i>Asio otus</i>	SSC/_/_
Short-eared owl	<i>Asio flammeus</i>	SSC/_/_
White-throated swift**	<i>Aeronautes saxatalis</i>	_/_/_
Costa's hummingbird**	<i>Calypte anna</i>	_/_/_
Say's phoebe**	<i>Sayornis saya</i>	_/_/_
<b>Gilded flicker</b>	<b><i>Colaptes chrysoides</i></b>	<b>SE/BCC/_</b>
<b>Gila woodpecker</b>	<b><i>Melanerpes uropygialis</i></b>	<b>SE/BCC/S</b>
Ash-throated flycatcher**	<i>Myiarchus cinerascens</i>	_/_/_
Vermilion flycatcher	<i>Pyrocephalus rubinus</i>	SSC/_/_
Western kingbird**	<i>Tyrannus verticalis</i>	_/_/_
Yellow warbler	<i>Dendroica petechia sonorana</i>	SSC/BCC/_
Yellow-breasted chat	<i>Icteria virens</i>	SSC/_/_
Loggerhead shrike**	<i>Lanius ludovicianus</i>	SSC/BCC/_
Common raven**	<i>Corvus corax</i>	_/_/_
California horned lark	<i>Eremophila alpestris actia</i>	WL/_/_
Northern rough-winged swallow**	<i>Stelgidopteryx serripennis</i>	_/_/_
Barn swallow**	<i>Hirundo rustica</i>	_/_/_
Cliff swallow**	<i>Petrochelidon pyrrhonota</i>	_/_/_
Purple martin	<i>Progne subis</i>	SSC/_/_
Verdin**	<i>Auriparus flaviceps</i>	_/_/_
Bewick's wren**	<i>Thryomanes bewickii</i>	_/_/_
Black-tailed gnatcatcher**	<i>Poliophtila melanura</i>	_/_/_

WILDLIFE		
Common Name	Scientific Name	Status State/Federal/the BLM
Bendire's thrasher	<i>Toxostoma bendirei</i>	SSC/BCC/S
Crissal thrasher	<i>Toxostoma crissale</i>	SSC/_/_
Le Conte's thrasher	<i>Toxostoma lecontei</i>	WL/BCC/S
Orange-crowned warbler**	<i>Vermivora celata</i>	_/_/_
Nashville warbler**	<i>Vermivora ruficapilla</i>	_/_/_
Black-throated gray warbler**	<i>Dendroica nigrescens</i>	_/_/_
Yellow-rumped warbler**	<i>Dendroica coronata</i>	_/_/_
Chipping sparrow**	<i>Spizella passerina</i>	_/_/_
Brewer's sparrow**	<i>Spizella breweri</i>	_/_/BCC/_
Lark sparrow**	<i>Chondestes grammacus</i>	_/_/_
White-crowned sparrow**	<i>Zonotrichia leucophrys</i>	_/_/_
House finch**	<i>Carpodacus mexicanus</i>	_/_/_
Mammals		
Pallid bat	<i>Antrozous pallidus</i>	CSC/_/_ / Sensitive
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	CSC/_/_ / Sensitive
Small-footed myotis	<i>Myotis ciliolabrum</i>	_/_/_/SSSensitive
Western yellow bat	<i>Lasiurus xanthinus</i>	SSC/_/_/SSSensitive
Western mastiff bat	<i>Eumops perotis californicus</i>	CSC/_/_ / Sensitive
California leaf-nosed bat	<i>Macrotus californicus</i>	CSC/_/_ / Sensitive
Yuma myotis	<i>Myotis yumanensis</i>	_/_/_ / Sensitive
Colorado Valley woodrat	<i>Neotoma albigula venusta</i>	_/_/_
Burro	<i>Equus asinus</i>	_/_/_/_/_
<b>Burro deer</b>	<b><i>Odocoileus hemionus eremicus</i></b>	_/_/_
Nelson's bighorn sheep	<i>Ovis canadensis nelson</i>	_/_/_ / Sensitive
Yuma mountain lion	<i>Puma concolor browni</i>	CSC/_/_
<b>American Badger</b>	<b><i>Taxidea taxus</i></b>	<b>CSC/_/_</b>
<b>Desert Kit Fox</b>	<b><i>Vulpes macrotis arsipus</i></b>	_/_/_
Insects		
Riverside cuckoo wasp	<i>Hedychridium argenteum</i>	_/_/_ / Sensitive
<b>Casey's June beetle</b>	<b><i>Dinacoma caseyi</i></b>	_/_/E/_
California mellitid bee	<i>Melitta californica</i>	_/_/_
Bradley's cuckoo wasp	<i>Ceratochrysis bradleyi</i>	_/_/_
Desert cuckoo wasp	<i>Ceratochrysis longimala</i>	_/_/_
Senile tiger beetle	<i>Cicindela senilis frosti</i>	_/_/_
Greenest tiger beetle	<i>Cicindela tranquebarica viridissima</i>	_/_/_

Sources: (Ex. 2000, p. 4.2-39 – 4.9-43).

\*\*These species were observed by Staff at the Palen Solar Energy Generating System Project site during site visits performed April 9 and 10, 2013.

±These species were observed by Staff immediately adjacent to the Palen site within ponds located in the agricultural areas.

**Status Codes:**

Federal FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range  
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future  
BCC: Fish and Wildlife Service: Birds of Conservation Concern: identifies migratory and non migratory bird species  
(beyond those already designated as federally threatened or endangered) that represent highest conservation priorities  
<[www.fws.gov/migratorybirds/reports/BCC2002.pdf](http://www.fws.gov/migratorybirds/reports/BCC2002.pdf)>

State CSC = California Species of Special Concern: species of concern to CDFW because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.

CFP = California Fully Protected  
SE = State listed as endangered  
ST = State listed as threatened  
SR = State listed as rare  
WL = State watch list

California Rare Plant Rank

List 1A = Plants Presumed Extirpated in California and Either Rare or Extinct Elsewhere  
List 1B = Rare, threatened, or endangered in California and elsewhere  
List 2A = Plants Presumed Extirpated in California, But More Common Elsewhere

List 2B = Rare, threatened, or endangered in California but more common elsewhere  
List 3 = Plants which need more information  
List 4 = Limited distribution – a watch list

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)

0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Bureau of Land Management

BLM Sensitive Species = Species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. The BLM sensitive species also include all Federal Candidate species and Federal Delisted species which were so designated within the last 5 years and CNPS List 1B plant species that occur on the BLM lands.

[http://www.blm.gov/style/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_manual.Par.43545.File.dat/6840.pdf](http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_manual.Par.43545.File.dat/6840.pdf).

Global Rank/State Rank

Global rank (G-rank) and State rank (S-rank) is a reflection of the overall condition of an element throughout its global (or State) range. Subspecies are denoted by a T-Rank; multiple rankings indicate a range of values. State rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank. An H-rank indicates that all sites are historical

G1 or S1 = Critically imperiled; Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals

G2 or S2 = Imperiled; 6-20 EOs OR 1,000-3,000 individuals

G3 or S3 = Rare, uncommon or threatened, but not immediately imperiled; 21-100 EOs OR 3,000-10,000 individuals

G4 or S4 = Not rare and apparently secure, but with cause for long-term concern; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.

G5 or S5= Demonstrably widespread, abundant, and secure.

Threat Rank

.1 = very threatened

.2 = threatened

.3 = no current threats known

## IMPACTS AND MITIGATION

**Biological Resources - Table 3  
Acreage of Direct and Indirect Impacts to Biological Resources and Mitigation**

Resource	Acres Impacted	Mitigation Ratio	Recommended Mitigation Acreage
<b>Desert Tortoise Habitat<sup>1</sup></b>			
Within Critical Habitat	228	5:1	1,140
Outside Critical Habitat	3,720	1:1	3,720
<b>Desert Tortoise Total</b>	<b>3,948</b>	—	<b>4,860</b>
<b>MFTL– Direct Impacts<sup>2</sup></b>			
Stabilized and partially stabilized sand dunes – direct impacts	187	3:1	561
Non dune habitats occupied by MFTL (sand fields vegetated with sparse creosote bush scrub)	1,292	1:1	1,292
MFTL – Indirect Impacts	421	0.5:1	210.5
<b>MFTL Total</b>	<b>1,900</b>	—	<b>2063.5</b>
<b>State Waters - Direct Impacts<sup>3</sup></b>			
Desert Dry Wash Woodland	206.5	3:1	619
Unvegetated Ephemeral Dry Wash	168.16	1:1	168
<b>State Waters Subtotal</b>	<b>374.7</b>	—	<b>787</b>
<b>State Waters – Indirect Impacts from Changes in Hydrology<sup>3</sup></b>			
Desert Dry Wash Woodland	0.03	1.5:1	0.045
Unvegetated Ephemeral Dry Wash	0.52	0.5:1	0.260
<b>State Waters Subtotal</b>	<b>0.55</b>	—	0.305
<b>State Waters Total</b>	<b>375.2</b>	—	<b>788</b>
<b>Burrowing Owl Habitat</b> – two pairs, four individuals, 19.5 acres each (per 1993 CBOC guidelines)	<b>78</b>	<b>n/a</b>	<b>78</b>

(Ex. 2000, p. 4.2-95.)

## **CUMULATIVE IMPACTS**

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects. (Cal. Code Regs., tit. 14, section 15130.)

As identified in the **PROJECT DESCRIPTION** section of this Decision, a number of projects within the region of the PSEGS have been approved, are under review, or in operation (see **Project Description - Tables 2, 3 and 4**). Our impacts analysis in the **BIOLOGICAL RESOURCES** section of this Decision is sorted by the biological resources impacted, and the cumulative impacts to each biological resource are analyzed along with the direct and indirect impacts. Therefore, there is no separate subsection addressing cumulative impacts. Also, Intervenors CRIT and CaRE presented testimony and several individuals submitted comments regarding the sacred connection between the Native American people and the flora and fauna of the Chuckwalla Valley and the significance of these biological resources to the tribes. In particular, the significance of avian species including small birds, night birds, quail, red tail hawks, roadrunners, eagles, and owls were described in the record. (Ex. 8035, 7/30/14 RT 298:11– 306:25; 309:24 – 310:6; 314:23 – 356:20.) Again, the PSEGS impacts to these biological resources are analyzed below.

### **Waters of the State**

**Biological Resources - Table 3** summarizes the direct and indirect impacts to waters of the state as a result of project construction, and includes recommendations from Energy Commission Staff and the California Department of Fish and Wildlife (CDFW) for compensatory mitigation ratios. (Ex. 2000, p. 4.2-96.)

Construction of the PSEGS project will result in direct and indirect impacts to numerous ephemeral streams and washes that occur within the project disturbance area. Construction and operation will alter the hydrological, biogeochemical, vegetation and wildlife functions of these drainages due to the construction of evaporation ponds, roads, and placement of the power towers, heliostats, and ancillary facilities. Approximately 374.7 acres of jurisdictional waters of the state were delineated by the project owner on the PSEGS project site and linear facilities. Waters of the United States do not occur on the project site or linear facilities. (Ex. 2000, p. 4.2-96.)

According to the evidence, the Energy Commission Staff, and CDFW maintain that wildlife habitat functions and values of the streams will be eliminated or significantly diminished by construction and operation of the facility, notwithstanding their

Biological Resources

acknowledgment that the PSEGS impacts to desert washes will be minimized by allowing water to pass through the site rather than diverting flows around the site in artificially constructed channels as contemplated in the PSPP design. The record indicates that approximately 27 percent of the site will be developed by dirt roads, heliostats, or other facilities. Activities including road construction and maintenance, the placement of perimeter exclusion fencing, dust and weed control, periodic vegetation removal, and mirror-washing would contribute to the loss of functions within the site. The functions and values of the ephemeral washes associated with the natural-gas pipeline and transmission line could also be adversely affected. (Ex. 2000, p. 4.2-96.)

Direct impacts to state jurisdictional waters include the removal of native vegetation including some areas characterized by microphyll woodland, the discharge of fill, degradation of water quality, and vegetation removal. Indirect impacts include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. As described previously, the diversity and episodic nature of streams and streambed materials creates habitat niches within the floodplain for wildlife. Operational impacts would include routine mowing of vegetation, vehicle access, weed abatement, mirror washing, and facility maintenance. Desert washes downstream from the project area, comprising approximately 32 acres of state waters, would be indirectly impacted as a result of changes to upstream hydrology; however, these effects should be minimal since flows will be allowed to pass through the site. Nonetheless, a small portion of these waters could be affected through the spread of weeds or disruption of flows. (Ex. 2000, p. 4.2-96.)

Direct and indirect impacts of the project to approximately 374.7 acres of state jurisdictional waters are significant. The extensive ephemeral drainage network at the project site currently provides many functions and values, including landscape hydrologic connections, stream energy dissipation during high-water flows that reduces erosion and improves water quality, water supply and water-quality filtering functions, surface and subsurface water storage, groundwater recharge, sediment transport, storage, and deposition aiding in floodplain maintenance and development, nutrient cycling, wildlife habitat and movement/migration, and support for vegetation communities that help stabilize stream banks and provide wildlife habitat. PSEGS would eliminate most of these functions and values from mowing, weed abatement, and the operation and maintenance of the facility. Remaining habitat features would not be available to many species of wildlife because the site would be fenced. (Ex. 2000, p. 4.2-97.)

Staff and CDFW agree that acquisition and enhancement of off-site state waters will mitigate project impacts for the PSEGS and are consistent with the Commission's PSPP Decision. The Energy Commission adopted a 3:1 mitigation ratio for desert dry wash

woodland as required by guidelines in the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) and a 1:1 mitigation ratio for the loss of ephemeral dry wash habitat. Table 3 of the project owner's Supplemental spring 2013 Biological Survey Report (Ex. 1049, p.22) identifies the expected direct and indirect impacts to state waters that would occur from the implementation of the PSEGS project. Condition of Certification **BIO-21** provides the specifics of impact avoidance and mitigation measures for impacts to ephemeral drainages of the Project Disturbance Area. We find that implementation of Condition of Certification **BIO-21** reduces project impacts to state waters to less-than-significant levels. (Ex. 2000, p. 4.2-97.)

The geographic scope for the analysis in evidence of cumulative impacts to desert washes (including intermittent and ephemeral washes) included the Palen watershed and greater Chuckwalla Valley. The primary hydrologic feature in the Palen watershed is Corn Springs Wash; several branches of the wash pass through or around the site, some of which abate before reaching Palen Dry Lake. This dry lake is the receiving basin for the 1,496 miles of desert washes that drain the watershed. Most of the desert washes that pass through the project site are distributary channels of the alluvial fan (or bajada) that drains the northeastern flank of the Chuckwalla Mountains. Staff analyzed the cumulative effects within the context of the watershed because this relatively small watershed would be affected by several proposed solar projects: Palen Solar Electric Generating System; First Solar Desert Sunlight; enXco 2; and Chuckwalla Solar 1. Existing impacts to desert washes in the Palen watershed include urban and agricultural lands around Desert Center, segments of the I-10 and Highway 177 corridors, Kaiser Mine, and various transmission corridors (gas and electric). (Ex. 2000, p. 4.2-197.)

The cumulative effects to desert washes within the Palen watershed are cumulatively considerable and the project itself would be a major contributor to those effects. The effects of all projects are compounded by the fact that they also cause impairment of hydrologic, geochemical, geomorphic, and habitat function and values of the remaining reaches downstream of the impact. (Ex. 2000, p. 4.2-198.)

Many of the existing washes in the Chuckwalla Valley have been subject to extensive impairment north of I-10. The highway roadbed and a series of collector ditches south of I-10 have permanently diverted stream flows into a few primary features and deprived flows from many miles of smaller washes. Standing dead ironwood trees, stunted, drought-stressed creosote bushes and other shrubs provide sparse cover with very low species diversity occurring north of I-10 in the Palen watershed. The decline in cover, vigor, and habitat function in this area is a testament to the downstream effects that channel diversions can have on both upland and riparian plant communities. Many of the smaller washes on the project site were already diverted and impaired by construction of I-10. Those washes were historically diverted into the three primary

washes that pass through or around the site. Theoretically, the extra flows may have enhanced the extent of the desert dry wash woodland on these three washes, but the negative impacts apparent in the thousands of acres outside of these washes reflects the importance of these smaller washes to both riparian and upland ecosystems. For the PSEGS project, impacts downstream from the site would be minimized by allowing existing flows to pass through the project. Allowing flows to pass through the project would minimize adverse effects to desert washes located in these areas. Therefore, we find the project would not contribute to cumulatively considerable impacts to desert washes in downstream areas. (Ex. 2000, p. 4.2-198.)

The effects of past, present, and foreseeable future projects combine with the project's effects and contribute to significant cumulative impacts on desert washes in the local watershed, particularly on the habitat functions and value of the washes. These effects include impacts to water quality and sediment transport from culverts and road crossings, fragmentation of the habitat and, the corresponding loss of habitat function and values including wildlife movement and the effects of interrupted fluvial sand transport on the Chuckwalla Valley dune system. (Ex. 2000, p. 4.2-198.)

Energy Commission Staff has concluded, and we find, that the PSEGS project's contribution to the direct loss of desert washes in the Palen watershed and surrounding region would be the same as the PSPP and will not be cumulatively considerable with implementation of Condition of Certification **BIO-21**, which requires the acquisition of desert washes within or adjacent to the Palen watershed. Conditions of Certification **BIO-8** (impact avoidance and minimization measures), and **BIO-7** (monitoring and reporting requirements) are designed to minimize accidental impacts during construction and operation. (Ex. 2000, p. 4.2-198.)

### **Impacts to Wildlife Connectivity**

The entire valley floor in this region is an important corridor that links the mountain ranges together and the culverts under I-10 are an important component of the corridor. The operation of the I-10 fragments the valley floor and makes it difficult for wildlife to disperse between mountain ranges. Wildlife may rely on these culverts to cross I-10 because high traffic volumes likely cause wildlife to avoid crossing over I-10, which is raised well above existing grade. (Ex. 2000, p. 4.2-97.)

Project impacts to the network of ephemeral drainages and the placement of perimeter fencing at the site will adversely affect wildlife connectivity and impede the ability of wildlife to move through washes and under I-10 in the project area. Evidence indicates that the culverts and associated major washes are used by a variety of wildlife, including deer, coyote, roadrunner, Black-tailed Jackrabbit, Gray Fox, Gambel's Quail, Woodrat, and other small rodents. The project owner's biologists found both recent and old tracks

indicating culverts are important crossing points for wildlife as they move between mountain ranges and along the valley floor. Partial fencing on the box culvert under I-10 at the central wash and complete fencing on the eastern culvert impedes some wildlife from using the culverts. CDFW reports that numerous tracks have been noted around three bridges under I-10 close to the site. (Ex. 2000, p. 4.2-97.)

The evidence shows that the majority of underpasses along a 32-mile stretch between Desert Center and Wileys Well Road are suitably open enough to allow wildlife movement and many provide moderate cover as well. This includes the underpasses closest to the PSEGS project. The PSPP Decision concluded that with implementation of conditions of certification, the PSPP project would not result in significant unmitigated impacts to connectivity for Desert Tortoise and other wildlife. Impacts to connectivity are similar for the PSEGS project and no changes to conditions of certification are necessary. Conditions of certification include Condition of Certification **BIO-9**, which requires construction of Desert Tortoise exclusion fencing on both sides of I-10 to direct Desert Tortoise and other wildlife to safe passage under the freeway bridges. (Ex. 2000, p. 4.2-98.)

In both the Palen-Ford Wildlife Habitat Management Area (WHMA) and Desert Wildlife Habitat Management Area Continuity Management Area (DWMA), the PSEGS project is a major contributor to the cumulative effects of future projects on the loss of Sonoran Creosote Bush scrub within the WHMA. Thus, PSEGS could impede wildlife movement in these corridors and obstruct connectivity for wide ranging wildlife such as Burro deer, Kit fox, coyotes, and badgers, and on a population level could impede gene flow for Desert Tortoises. However, some connectivity will remain from existing underpasses along I-10. The evidence indicates that connectivity of habitat along 32-miles of I-10, including 24 under-crossings is preserved along this stretch of the freeway near the project. We find that with implementation of the measures described below, the project will not result in cumulatively considerable unmitigated impacts to connectivity for Desert Tortoise and other wildlife. This conclusion is consistent with the Commission's Decision for the PSPP. (Ex. 2000, p. 4.2-208.)

Condition of Certification **BIO-21** requires that compensation for the loss of desert washes, desert dry wash woodland, and their associated upland habitat must occur within Palen and adjacent watersheds; this is expected to minimize impacts in the Palen-Ford WHMA and DWMA Continuity WHMA to less-than-cumulatively-considerable levels by ensuring that mitigation occurs locally and that further fragmentation is prevented by permanently protecting these lands from future development. Impacts to connectivity for Desert Tortoise could be minimized if the Desert Tortoise compensation lands were targeted for areas that would enhance wildlife connectivity within the same WHMA and corridor. Condition of Certification **BIO-12**

requires that the land acquisitions be within the Colorado Desert Recovery Unit and have potential to contribute to Desert Tortoise habitat connectivity and build linkages between Desert Tortoise populations and designated critical habitat. (Ex. 2000, p. 4.2-208.)

Although the implementation of these conditions of certification will reduce the project's contribution to cumulative impacts to wildlife movement and connectivity to less-than-cumulatively-considerable levels, there may still be minor residual impacts. These residual effects from all future projects can only be addressed through a regional and coordinated planning effort aimed at preserving and enhancing large, intact expanses of wildlife habitat and linkages, including maintaining connections between wildlife management areas and other movement corridors. Ongoing collaborative efforts by federal and state agencies to develop the Desert Renewable Energy Conservation Plan (DRECP) and the 2012 BLM Solar Energy Development Programmatic EIS offer an appropriate forum for such planning. (Ex. 2000, p. 4.2-208.)

### **Impacts to Sand Transport Corridor and Sand Dune Habitat**

The PSPP analyzed impacts to sand transportation to/from sand dunes in the Project Disturbance area. The analysis divided the sand transport corridor into different zones based on the amount of sand transported, noting that Zone 1 (off the project site) transports "a minimum of 80 percent" of the total volume of sand within the corridor, sand migration within Zone 2 is described as "moderately strong," and sand transport in Zone 3 is "relatively low." (Ex. 2000, p. 4.2-98.)

The PSPP Decision concluded that the intrusion of the project within an active sand transport corridor, Zone 2, and to a lesser extent Zone 3, would have significant on-site impacts and would interfere with the creation and maintenance of sand dunes off-site. The Palen Dry Lake–Chuckwalla sand corridor is a major source of sand that supports downwind sand dunes; because most sand transport takes place close to the ground (a general rule of thumb is that 90 percent of sand transport occurs within 6 feet of the ground surface), wind fences and solar arrays would effectively block sand transport. (Ex. 2000, p. 4.2-98.)

The PSPP was also found to have off-site impacts such as cutting off the supply of sand within the PSPP Project Disturbance Area that would otherwise have been transported downwind to other dune areas, and which would deflate downwind sand dunes, gradually diminishing their depth and extent over time, as sand output exceeds sand input. New sand that would have been transported across the project footprint from upwind would potentially be cut off by drainage ditches, wind fences, and above ground infrastructure. (Ex. 2000, p. 4.2-98.)

The PSEGS project has been designed to eliminate the PSPP project's 30-foot-tall wind fences that contributed to disruption of the sand transport. The PSEGS project boundary is proposed to be defined by an 18-inch tortoise fence surmounted by a 7-foot chain-link fence, which will have a very different effect on wind flow and sand transport. Both Staff's and the Petitioner's assessment of the effects of the PSEGS project indicate that the new project footprint and facility features, such as size and number of pylons used to support heliostats and the presence of the towers and the footings they require, has greater effects to the sand transport system than the PSPP project. (Ex. 2000, p. 4.2-99.)

The evidence indicates that blockages in the sand transport system start a cascading chain of events. When sand supply is interrupted, deflation of the area begins to occur, as enough sand is not available to maintain the dune structure, and wind and surface water flow continue to move sand out of the area. As this deflation occurs, a successional shift in the type of cover of plant species inhabiting the dunes will occur and, generally, the dunes will become stabilized over time as plant roots and corresponding biota accumulate. The PSPP Decision relied on a threshold of 25 percent sand corridor blockage when it imposed Condition of Certification **BIO-20**. Therefore, we continue to use the threshold of 25 percent corridor blockage to be significant, and believe this level of habitat degradation should be mitigated consistent with the mitigation approach for the PSPP. (Ex. 2000, p. 4.2-100.)

The PSPP also had an impact on sand transport by eliminating the network of desert washes throughout the site and replacing them with engineered channels. The PSEGS eliminates the large drainage control channels and the majority of the project site maintains the original grades and natural drainage features. However, indirect impacts to sand transport are greater for the PSEGS than the PSPP, primarily due to the heliostat array. The evidence indicates that the PSEGS heliostat array is predicted to have a very significant effect on sand transport such that sand transport will be reduced by 93 percent at 1,738 feet into the array. (Ex. 2000, p. 4.2-100.)

The approved PSPP Reconfigured **Alternatives 2** and **3** shifted the project footprint out of the sand transport corridor and, thus, avoided substantial interference with the sand transport corridor and reduced impacts to sand dune dependent species such as MFTL. The PSEGS project footprint is still within the sand transport corridor and the heliostats field intrudes further than wind fence for the PSPP Reconfigured **Alternatives 2** and **3**. Therefore, the PSEGS will have greater effects than either of the approved Reconfigured **Alternatives 2** or **3**. The direct and indirect impacts of the PSEGS on sand dunes and the processes that support them would significantly affect sand- dune-dependent species such as MFTL and could also impact Harwood's woollystar, Harwood's milkvetch, and sand dune-dependent insect species. The significant direct

and indirect impacts of PSEGS to sand dune habitat can be mitigated to less-than-significant levels with implementation of Condition of Certification **BIO-20**, which requires the purchase of compensation lands. (Ex. 2000, pp. 4.2-100 – 4.2-101.)

Condition of Certification **BIO-20** requires implementation of impact avoidance and minimization measures and acquisition of dune habitat at a 3:1 ratio for the sand dune habitat loss attributable to the project, and a 1:1 ratio for other sandy habitats that support MFTL (e.g., sandy plains, sand-covered fans, and sand-covered playas) and 0.5:1 for indirect impacts to the sand transport corridor. These acquisitions would need to be targeted for dune habitat within the Chuckwalla Valley with potential to contribute to MFTL habitat connectivity. Evidence indicates that implementation of **BIO-20** would offset the project's contribution to the loss of habitat. (Ex. 2000, p. 4.2-210.)

The project's contribution to cumulatively considerable indirect effects from the spread of Sahara mustard and other invasive pest plants into dunes and the adjacent habitats upslope will be minimized to a level less than cumulatively considerable through implementation of Conditions of Certification **BIO-14** (Weed Management Plan) and **BIO-27** (revegetation of temporarily disturbed areas using locally native seed). Impacts to the groundwater-dependent ecosystems that occur around the playa and in dunes will be minimized through **BIO-23** and **BIO-24** (monitoring of groundwater-dependent vegetation and remedial action in the event of adverse effects).

The effects of past, present, and foreseeable future projects combined with the PSEGS project's effects contribute to a significant cumulative effect to dune habitat from obstruction of wind and fluvial sand transport systems (which are essential for the maintenance of the dunes) by new structures and wind fencing, fragmentation and degradation of remaining habitat by roads, development, off-road vehicles, altered drainage patterns, and the spread of noxious weeds and other invasive plants such as Russian thistle and Sahara mustard. Habitat values for dune-dependent wildlife are also affected by increased predation from avian predators that benefit from new perching structures. The evidence suggests that cumulative impacts of the projects to dune habitat function and value are cumulatively considerable and may not be adequately mitigated through habitat acquisition under Condition of Certification **BIO-20** when considering the project's significant indirect impacts to the sand transport corridor. This conclusion is consistent with the Commission's Decision for the PSPP. (Ex. 2000, pp. 4.2-210 – 4.2-211.)

## **Impacts to Groundwater-Dependent Vegetation from Groundwater Pumping and Project Groundwater Use**

The PSEGS project will use less groundwater during both construction and operation than the originally approved PSPP project. Construction groundwater use is stated to be 1,130 acre-feet per year (AFY), a reduction from the original permitted project groundwater consumption of 1,917 AFY. Operational groundwater use is stated as 201 AFY, a reduction of nearly 100 AFY. No further analysis regarding groundwater dependant vegetation is necessary for the PSEGS project because the original analysis is considered conservative, tailored to mitigate for greater impacts and, therefore, still fully protective of groundwater dependant resources.

The cumulative impact analysis in the **SOIL AND WATER RESOURCES** section indicates that groundwater extraction during construction and operation of this and other foreseeable projects would place the Chuckwalla Valley groundwater basin into an overdraft condition. This impact may be exacerbated by other unidentified renewable energy projects in the I-10 corridor, which has been targeted as a potential area for further renewable energy development. However, the evidence in the Soil and Water Resources section of this Decision led to the conclusion that the project's contribution (201 AFY) to this cumulative effect is less than cumulatively considerable, but recommended a number of monitoring conditions to ensure that the project's impact to area wells was less than cumulatively considerable. This conclusion is consistent with the Commission's Decision for the PSPP. (Ex. 2000, p. 4.2-211.)

Groundwater pumping could have a significant indirect impact to biological resources if it lowers the water table in areas where deep-rooted phreatophytes occur, such as mesquite bosques and succulent chenopod scrubs or alkali sink scrub. To ensure that the project will not adversely affect groundwater-dependent vegetation near the project well, Condition of Certification **BIO-23** requires groundwater-dependent vegetation monitoring within two to three miles of the project well for the life of the project. Condition of Certification **BIO-24** requires a remedial action plan that will be triggered in the event that impending impacts to groundwater-dependent vegetation are detected during the vegetation, soil and shallow groundwater monitoring required in **BIO-23**. With implementation of Conditions of Certification **BIO-23** and **BIO-24**, PSEGS impacts to biological resources dependent upon the Chuckwalla Valley groundwater basin will be less-than-cumulatively considerable. (Ex. 2000, p. 4.2-211.)

## **Special-status Species: Impacts and Mitigation**

### Special-status Plant Species

#### Regional Overview

The Sonoran Desert region of southeastern California, a region bounded by the Mojave Desert to the north and by the higher elevations of the Peninsular Ranges to the west, has a uniquely ‘tropical’ warm desert climate influenced by the addition of monsoonal summer rains; a contrast to the dry summer Mediterranean climate that characterizes much of California. This southeastern corner of California has a bi-modal rainfall pattern with cooler late fall and winter rains that originate in the North Pacific Ocean and tropical summer storms from southern Mexico. (Ex. 2000, p. 4.2-169.)

The unique position of the region at the junction with the Neotropic ecozone to the south contributes to the presence of a number of rare and endemic plants and vegetation communities specially adapted to this bi-modal rainfall pattern and not found elsewhere in California. These include microphyll woodlands, palm oases, and a number of summer annuals that only germinate after a significant warm summer rain. (Ex. 2000, p. 4.2-170.)

This distinctive bi-modal climate of the Sonoran Desert distinguishes it floristically from other deserts including the Mojave Desert and from the rest of California, and is characterized by warm dry summers and a single rainy season in winter. In addition to being hotter and drier, the Sonoran Desert region also rarely experiences frost. Although the region supports numerous perennial species, including a wide variety of cacti, more than half of the region’s plant species are herbaceous annuals that reveal themselves only during years of suitable precipitation and temperature conditions. (Ex. 2000, p. 4.2-170.)

This region also occupies an important biogeographic location and zone of ecological transition on the Pacific Coast of North America, and so its floristic diversity includes many widespread taxa on the edge of their range. This includes all of the California Rare Plant Rank (RPR), two plants occurring in the region (species that are more common outside of California), but here they represent geographically marginal peripheral populations on the frontiers of their range. The evolutionary significance (and therefore the conservation value) of peripheral populations are well documented, as is their greater risk of extirpation. (Ex. 2000, p. 4.2-170.)

The results of spring 2009 and 2010 and fall 2010 surveys for the PSPP, and spring 2013 surveys of the PSEGS project linears indicated that construction of the project, including the plant facility, transmission line, access road, telecommunication line, and construction water supply line could directly and/or indirectly impact five special-status plant species: Harwood’s woollystar (*Eriastrum harwoodii*, also sometimes referred to

as Harwood's phlox or Harwood's eriastrum), a BLM sensitive species; Harwood's milkvetch (*Astragalus insularis* var. *harwoodii*); Ribbed cryptantha (*Cryptantha costata*); California ditaxis (*Ditaxis serrata* var. *californica*); and "Palen Lake saltbush" (*Atriplex* sp. nov. Andre), a potentially new taxon of saltbush detected on the margins of Palen Lake. (Ex. 2000, p. 4.2-170.)

These five special-status plant species have the potential to be directly and/or indirectly impacted by construction of the PSEGS including the plant facility, transmission line, access road, telecommunication line, natural-gas line, and construction water supply line. However, dune-associated species are less likely to be present on the natural-gas-pipeline alignment. (Ex. 2000, p. 4.2-170. – 4.2-171.)

Significant cumulative effects to plant communities from proposed future projects are expected to occur in many community types, particularly playa, Sonoran creosote bush scrub, and desert dry wash woodland. Similarly, indirect effects to remaining habitat would occur from fragmentation and alteration of the surface drainage patterns that support many common and rare species to both riparian and upland habitats. There are other reasonably anticipated indirect effects from the project, including the cumulatively considerable effect of an increase in the risk of fire (from increased vehicle use of area roads) and the introduction and spread of noxious weeds. Sahara mustard is of particular concern because it is already infesting many areas on and adjacent to the project and has the potential to spread explosively if not carefully managed. Climate change is expected to exacerbate the effects of drought and noxious weed spread. The project may also have a cumulatively considerable impact on groundwater-dependent ecosystems in the Palen Lake watershed from its proposed construction-related groundwater pumping. The project contributes, at least incrementally, to the cumulative loss of Sonoran creosote bush scrub and desert dry wash woodland. Sonoran creosote bush scrub is a common and widespread plant community in the southeastern deserts of California; however, this broad designation does not reflect the importance of large, intact blocks of habitat to wildlife movement, or to foraging and breeding habitat for wildlife, including state and federal listed species. The NECO mapping of plant communities also does not reflect the many uncommon and even rare plant assemblages within creosote scrub that have been documented and are monitored by the CDFW. (Ex. 2000, p. 4.2-208 – 4.2-209.)

Condition of Certification **BIO-12** for acquisition of 4,860 acres of Desert Tortoise habitat (Sonoran creosote bush scrub) in Chuckwalla Valley, and Condition of Certification **BIO-21** for acquisition and protection of 788 acres of desert washes and desert dry wash woodland, minimize the project's contribution to the cumulative loss of these habitats to a level less than cumulatively considerable. While acquisition does not address the net loss of habitat in the immediate future (a temporal net loss of habitat), it

is expected to prevent future losses of habitat by placing a permanent conservation easement and deed restrictions on private lands that could otherwise be converted for urban, agricultural, or energy development. (Ex. 2000, p. 4.2-209.)

Condition of Certification **BIO-14** for weed management will offset the project's contribution to the indirect cumulative effects of all projects on the spread of non-native invasive plants and their effects on wildlife and fire risk. Conditions of Certification **BIO-23** and **BIO-24** for monitoring of groundwater-dependent vegetation (and remedial action in the event of adverse effects) reduces the project's contribution to this effect to a level less than cumulatively considerable. (Ex. 2000, p. 4.2-209.)

Playas and dry lakebeds appear to be disproportionately affected by the cumulative effects of potential future projects across NECO. Due to their limited extent and potential status as jurisdictional state waters and their hydrologic importance and seasonal value to wildlife, Staff considers this a significant cumulative effect. However, the project does not contribute directly to this effect. The project's potential indirect effects to nearby playa habitats would be minimized to a level less than cumulatively considerable through the implementation of **BIO-23** and **BIO-24**.

### **Harwood's Woollystar**

Harwood's woollystar, also sometimes referred to as Harwood's phlox or Harwood's eriastrum, is a BLM sensitive species and RPR 1B.2 species, which indicates it is rare, threatened, or endangered throughout its range. This spring annual is associated with sandy plains or dunes, but typically semi-stabilized habitat (versus active dunes). Its global distribution and range is restricted to 14 known locations in San Diego, Riverside, and San Bernardino Counties, typically in dunes associated with the margins around dry lakes such as Dale, Cadiz, and Soda Lakes. Recently, surveys conducted in the spring of 2010 for the Blythe Solar Power Project (BSPP) located this plant primarily in the sandy areas south of I-10 where 2,134 plants were located and mapped; the majority of these plants occurred at the Colorado River Substation site. Harwood's woollystar was not previously known to occur in the project vicinity; the nearest known occurrences were at Anza Borrego to the west and to the north in the Dale Lake, Cadiz Valley area, and Ward Valley dune systems in San Bernardino County. (Ex. 2000, p. 4.2-173.)

A total of 13 GPS points totaling 169 plants were found in the dunes to the east of the PSEGS project. No plants were found within the Project Disturbance Area. The closest occurrences appear to be located on the dunes approximately 3,000 feet from the Project Disturbance Area. Based on these results, the PSPP Decision found that the PSPP project would not result in direct impacts from construction, or indirect impacts from hydrologic changes to downstream areas supporting Harwood's woollystar. We find this to be true for the PSEGS project as well. Although the project would have no

direct effects, evidence suggests that the project could contribute to the spread of Sahara mustard within Chuckwalla Valla and its dune habitats. The conditions of certification below require the PSEGS to reduce the projects potential effects to Harwood's woollystar. These include Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-14** (Weed Management Plan). Implementation of **BIO-8** and **BIO-14** will reduce the project's contribution to the spread of Sahara mustard into Harwood's woollystar habitat to a less-than-significant level. No new conditions of certification are proposed for the PSEGS. (Ex. 2000, pp. 4.2-173 – 4.2-174.)

### **Harwood's Milkvetch**

The evidence indicates that Harwood's milkvetch is rare, threatened, or endangered in California, but more common elsewhere. It is also a covered species under the NECO Plan. It is found in desert dunes and sandy or gravelly areas in portions of Imperial, Riverside, and San Diego Counties. Herbarium collections occur for this species from Ogilby Road in Imperial County and three locales west of Blythe, the Pinto Basin, and Chuckwalla Basin in Riverside County. Harwood's milkvetch has also been reported from Baja California, Sonora Mexico, and portions of Yuma County, Arizona. The Harwood's milkvetch populations on the southern deserts are presumed stable given limited disturbance to their desert habitats, but the recent focus for renewable energy development could affect a large portion of its habitat in Chuckwalla Valley and the broader NECO planning area. (Ex. 2000, p. 4.2-174.)

spring 2010 surveys identified only seven Harwood's milkvetch individuals in the PSPP Project Disturbance Area out of a total population of approximately 146 plants. However, many of the 140 plants documented in the buffer area for the PSPP are located in close proximity to the northern boundary of the PSEGS project and in areas downstream of the site. Based on a review of the data it appears that six of the seven plants identified in the PSPP Project Disturbance Area would be directly impacted by the PSEGS project. The 140 plants documented in the buffer area for the PSPP are also located adjacent to the PSEGS northern boundary, therefore impacts would be similar. (Ex. 2000, p. 4.2-175.)

The record suggests that the direct loss of six plants due to the PSEGS is an insignificant direct effect, given the large number of plants found off the project site and in the buffer zone of other projects in the vicinity. Approximately 700 Harwood milkvetches were documented in the GSEP study area and 2,748 plants were documented in the BSPP and the Colorado Substation study areas. Although the direct impacts of the PSEGS project to Harwood's milkvetch would be minor, additional accidental impacts could occur during construction, and indirect impacts from the spread of Sahara mustard and other weeds into adjacent habitat (an effect observed in nearby

transmission projects and along roads) could result in impacts to this species. The evidence suggests also that plants located downstream of the project could be indirectly affected through the spread of weed seed, altered hydrology, or sediment transport. Harwood's milkvetch may respond favorably to disturbance (loose, sparsely vegetated soils), but most weeds also quickly colonize disturbed soils. (Ex. 2000, p. 4.2-175.)

Condition of Certification **BIO-14**, directs the project owner to finalize and implement a detailed weed management plan that specifies detailed mapping, monitoring, and reporting requirements. Weed management minimizes the risk of Saharan mustard and other invasive species from colonizing the disturbed soils along temporary access roads and transmission corridors, both of which are a common conduit for the spread of invasive pest plants. **BIO-19** (Special-status Plant Avoidance and Minimization Measures) prevents the off-site occurrence of accidental impacts during construction and indirect effects during operation and closure activities. **BIO-27** (Revegetation of Temporarily Disturbed Areas) was designed to minimize the risk of Saharan mustard and other invasive species from colonizing the disturbed soils along temporary access roads and transmission corridors, both of which are a common conduit for the spread of invasive pest plants. **BIO-8** (Impact Avoidance and Minimization Measures) and weed management measures in **BIO-14** (Weed Management Plan) also reduce risk to Harwood's milkvetch. (Ex. 2000, pp. 4.2-175 – 4.2-176.)

No compensatory mitigation is required for Harwood's milkvetch as only a small number of plants will be directly affected; however, we will require the compensatory mitigation for dunes and washes (habitat for Harwood's milkvetch) in **BIO-20** and **BIO-22** within the Chuckwalla Valley region. This additional requirement will minimize the cumulative effects of fragmentation by protecting, in perpetuity, private lands in the range of the species in Chuckwalla Valley from future development. (Ex. 2000, p. 4.2-176.)

Although the project's direct impacts to Harwood's milkvetch are minor, they are cumulatively considerable when combined with the reasonably expected indirect effects of noxious weeds and fragmentation. This conclusion is consistent with the Commission's Decision for the PSPP. (Ex. 2000, p. 4.2-212.)

Harwood's milkvetch habitat would be disproportionately affected by renewable development in the region, and the species' range in California is nearly restricted to the NECO planning area. In the Chuckwalla Valley, its habitat is affected by probable future projects and some has already been lost from development. Although the project's contribution to these effects may be individually small, it contributes, at least incrementally, to a cumulatively considerable effect. (Ex. 2000, p. 4.2-212.)

Other species restricted to dune and playa habitats, washes, and other sandy habitats also have occurrences outside of federal wilderness or state park lands and are

threatened by renewable energy development, but the cumulative effects to Harwood's milkvetch are of particular concern due to the position of many occurrences in the immediate vicinity of probable future projects and the likelihood of significant indirect effects. (Ex. 2000, p. 4.2-212.)

Indirect effects to Harwood's milkvetch and other plants occurring in close proximity to the project, and to which the project has a cumulatively considerable contribution, include altered drainage patterns, disrupted wind- or fluvial-sand transport processes, fragmentation of the habitat and reduced gene flow between isolated populations, and the spread of non-native plants that fuel fires and degrade habitat. Climate change is expected to exacerbate the effects of drought, and CO<sub>2</sub> concentration has already been demonstrated to promote the spread of invasive plants. (Ex. 2000, p. 4.2-212.)

The project's contribution to cumulatively considerable impacts to all special-status plants including Harwood's milkvetch in the project area will be minimized to a level less-than-cumulatively considerable through implementation of **BIO-19** (Avoidance & Minimization Measures for Special-status Plants) and through the additional avoidance and compensation requirements described in **BIO-19**. The project's contribution to the spread of noxious weeds will be minimized through **BIO-14** (Weed Management Plan). All of the special-status plants are associated with dunes, washes, or playa. **BIO-20** (Dune Compensation) and **BIO-21** (Compensation for Desert Washes) will minimize future development and fragmentation in the Chuckwalla Valley Region by requiring that compensation occur locally. These conclusions are consistent with the Commission's Decision for the PSPP. (Ex. 2000, p. 4.2-213.)

### **Ribbed Cryptantha**

Ribbed cryptantha has limited distribution in California; however, it is not very threatened in California. There are 116 records of this species from several locations throughout Riverside, San Diego, and Imperial Counties in the Consortium of California Herbaria database; the nearest collection is from the Palen Valley approximately 3 miles east of the Desert Center Airport. (Ex. 2000, p. 4.2-176.)

Spring 2010 botanical surveys identified several large populations of this species, estimated in the millions, within both the Project Disturbance Area and buffer area for the approved PSPP project. Sampling was used in the field to establish an estimate of 8,903 plants per acre (Solar Millennium 2010m). Approximately 285 acres and 1,309 acres of occupied ribbed cryptantha acreage were estimated within the PSPP Project Disturbance Area and buffer area, respectively. It was estimated that an area of approximately 406 acres (estimated 3.6 million plants) located within the Project Disturbance Area would be directly impacted by the PSPP project. Similar numbers of this species will be impacted by the PSEGS project. (Ex. 2000, p. 4.2-176.)

Given the large number of ribbed cryptantha plants detected by all the I-10 projects, within and outside of their project areas, the evidence suggests that ribbed cryptantha are likely to occur in similar habitats nearby. Due to the local abundance of ribbed cryptantha and its apparently stable range in California, the direct impacts of the PSEGS project, like the PSPP project, to ribbed cryptantha and its habitat will be less than significant. (Ex. 2000, p. 4.2-176.)

Implementation of **BIO-8**, **BIO-14**, **BIO-19** (avoidance and minimization measures), **BIO-20**, and **BIO-21** further reduce the impacts to this species. **BIO-20** and **BIO-21** help minimize future fragmentation of the habitat and other indirect impacts to the local plant population by placing large portions of private land within the Chuckwalla Valley under a permanent conservation easement. (Ex. 2000, p. 4.2-177.)

### **California Ditaxis**

California ditaxis is a CNDDDB State Rank (S Rank) 2 (imperiled) species known from 15 occurrences statewide. The “2” threat rank means that the 15 documented occurrences in California are fairly threatened. The PSPP Decision treated it as a special-status species warranting consideration under CEQA. One group of 11 California ditaxis plants were observed within the Project Disturbance Area along the generation tie-line alignment for the PSEGS. Another group of 11 plants was found in the survey buffer area. (Ex. 2000, p. 4.2-178.)

In addition to the direct impacts to plants within the PSEGS Project Disturbance Area (50 percent of the local population), plants adjacent to the alignment could be indirectly affected by the spread of Sahara mustard, which out-competes with the plants, degrades the habitat, and increases the risk of fire. Roads and transmission corridors are common vectors for the spread of Sahara mustard. Vehicles are also common ignition sources for roadside fires, and the weeds that typically recolonize disturbed soils along roads and transmission corridors tend to increase the flammability. Changes to the vegetation management regime may increase the risk of spread of Sahara mustard. The PSPP Decision considered the loss of half of the occurrence, combined with the indirect effects of Sahara mustard, to be significant given that there are no other documented occurrences in the valley west of Desert Center. The Commission adopted the avoidance and minimization measures contained in **BIO-19**, which required the project owner to limit the width of the work area, adjust the locations of poles, road and pipeline alignments, establish fenced environmentally-sensitive areas, and a variety of other measures aimed at preventing accidental impacts during construction, and indirect impacts during operation. We would impose the same measures for the PSEGS project because the impacts are similar. We find that with implementation of **BIO-8** (Impact Avoidance and Minimization Measures), **BIO-14** (Weed Management Plan) and **BIO-19**, impacts to the California ditaxis and the contribution of the PSEGS project to

the spread of Sahara mustard would be less than significant. (Ex. 2000, pp. 4.2-177 – 4.2-178.)

### **Palen Lake Saltbush (*Atriplex* sp. nov. Andre)**

A potentially new taxon of saltbush (*Atriplex*) was discovered on the saline playa margins of Palen Dry Lake in 2009, and has been proposed in a preliminary report. The unnamed saltbush was first collected in 2005 at the dry lake just northeast of the Interstate 15 and Highway 95 junction, approximately 35 miles east and northeast of Las Vegas, Nevada. The first confirmed observation of it in California was at Palen Lake in 2009. According to Andre, there is potential for it to occur along the I-8 corridor in Imperial County. It may also have been observed in the Ford Dry Lake area (unconfirmed) and it has been observed in other saline (but non playa) habitats on remnants of the lower Colorado River floodplain. (Ex. 2000, p. 4.2-178.)

According to the record, the unnamed saltbush resembles the common four-wing saltbush (*Atriplex canescens*) (a common plant of dunes which has very linear leaves). The new taxon has obovate leaves that distinguish it from all four-wing saltbush and its subspecies. It is also generally more confined to subsaline/saline playa margins than the common four-wing saltbush. (Ex. 2000, p. 4.2-178.)

According to the PSPP project owner's map of special-status plants in the preliminary 2010 botanical report, no plants would be directly affected; however, some of the 920 plants documented in the buffer occurred in close proximity to the northeastern boundary of the PSPP project and could be indirectly affected by the project. For the PSEGS there is a considerable buffer between the boundary of the project and the location of the mapped saltbush. Therefore, we find that for the PSEGS, the avoidance and minimization measures described in section A of **BIO-19** would not be necessary; however, we will impose **BIO-19** (section A) to minimize the PSEGS project's potential for indirect impacts during operation and accidental construction impacts. (Ex. 2000, p. 4.2-179.)

Condition of Certification **BIO-23** specifies vegetation, soil, and groundwater monitoring in the area affected by pumping for the life of the project. **BIO-24** prescribes remedial measures and compensatory mitigation if the monitoring indicates an impending decline in habitat function and value. Section A of **BIO-19** minimizes the indirect effects of the project and avoids accidental impacts during construction for plants located in close proximity to the PSEGS project. With implementation of these measures, we find that the indirect impacts of the project to the Palen Lake saltbush (Andre, sp. nov.) will be minimized to a less-than-significant level. (Ex. 2000, pp. 4.2-179 – 4.2-180.)

## **Utah Vining Milkweed**

Until recently discovered growing on the Palo Verde Mesa, this species was not expected to occur in the project area and it was believed that the project was outside of the range of Utah vining milkweed. There are 58 records of this species from the Consortium of California Herbaria database primarily from San Bernardino and San Diego Counties. There is one record from the Big Maria Mountains from wash and stabilized dune habitat at approximately 1,200 feet elevation. One population of Utah vining milkweed was found east of the project site at least 2.5 miles east of the eastern project boundary and outside of the Project Disturbance Area for the PSEGS and buffer area. Therefore, we find no direct or indirect impacts would occur to this species and no mitigation is needed. (Ex. 2000, p. 4.2-180.)

## **Abram's Spurge**

Abram's spurge is a CNDDDB S Rank 2 species, meaning it is 'imperiled' within its range in California due to very restricted range and very few populations (often 20 or fewer). Contrary evidence suggests that Abram's spurge is so abundant along the I-10 corridor that its current ranking is being revisited. Currently this species is ranked 2B and will be until, or if, it ever goes through a CNPS status review process for a rank change and, therefore, should be fully considered during preparation of environmental documents relating to CEQA. (Ex. 2000, p. 4.2-182.)

Abram's spurge is a summer annual that is triggered to germinate by significant summer monsoonal rains; consequently its year-to-year population size is highly variable. The playa margins and washes could support this species as it is known from similar habitats nearby at Ford Dry Lake. This species is known to occur in halophytic (saline-alkaline) flats, playas, and along inlets and floodplains of playas. The blooming period is described as September through November, but could be detected earlier if a significant summer rain event occurred in June. On average, August receives the most rainfall, but the warm monsoonal rains sometimes overlap the start of the fall-winter rains of Pacific Northwest origin. (Ex. 2000, p. 4.2-182.)

The CNDDDB lists 15 occurrences of this plant in Riverside, Imperial, San Bernardino, and San Diego Counties in California, east through Nevada to Arizona, and as far south as Baja, California and Mexico. Of the total of 15 occurrences in California, seven of these are protected under National Park Service, CDFW, or California State Park ownership. A recent (2000) CNDDDB record (#5) is from a location approximately 0.50 miles east of Ford Dry Lake on Gasline Road just south of I-10, and the occurrence was reported as a "substantial population." (Ex. 2000, p. 4.2-183.)

If Abram's spurge occurs within or near the Project Disturbance Area, evidence indicates that direct or indirect impacts would be significant unless only a minor portion

of its local population, or habitat, was affected. Even if the occurrence was off site, it could be indirectly affected if it occurred in close proximity to construction. Staff is also concerned about the contribution of the project to the spread of Sahara mustard and other invasives. Construction-related disturbance, roads, transmission corridors, and the transport of seed via washes are common vectors for Sahara mustard and other weeds. (Ex. 2000, p. 4.2-183.)

The record shows that potential direct impacts to Abram's spurge can be mitigated to a level less than significant through implementation of subsection B of **BIO-19**, which mandates late-season botanical surveys, and by subsection C, which prescribes a level of avoidance and off-site mitigation depending on the species status, rarity, and other factors. Section D provides measurable performance standards for off-site mitigation for unavoided impacts. Section A protects any occurrences found in close proximity through a variety of BMPs and other measures. Modifications to **BIO-19** allow for complete avoidance along linears unless avoidance would cause disturbance to areas not previously surveyed for biological resources or would create greater environmental impacts in other disciplines (e.g. cultural resource sites) or other restrictions. If complete avoidance is not possible, mitigation at a 2:1 ratio will be required. (Ex. 2000, p. 4.2-183.)

To address indirect and cumulative impacts to Abram's spurge, **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-14** (Weed Management Plan) will minimize the contribution of the project to the spread of Sahara mustard and other weeds. The conditions of certification require that acquisition for dunes and washes (Conditions of Certification **BIO-20** and **BIO-21**) must occur within the Chuckwalla Valley Region. This will minimize future fragmentation of Abram's spurge habitat (playa margins and washes) by placing private lands under permanent protection and preventing future development and the indirect effects of weeds and fragmentation that accompany development. (Ex. 2000, p. 4.2-184.)

### **Flat-seeded Spurge**

Flat-seeded spurge is rare, threatened, or endangered throughout its range and it is fairly threatened in California. It is also a BLM sensitive species. Very little is known about the species because there are few or no extant occurrences. Its micro-habitat preferences are described as "sandy places or shifting dunes" and by the Arizona Native Plant Society as "shifting dunes of low to medium height." This suggests that the northeastern corner of the project was the most likely place for it to occur. It was not detected in this part of the PSPP during fall 2010 surveys. However, one botanist suggested that weedy disturbed areas and culverts where water collects should not be overlooked (Silverman pers. comm.). If present, impacts to flat-seeded spurge, a BLM sensitive species, would be considered significant. (Ex. 2000, p. 4.2-184.)

The closest known occurrence of flat-seeded spurge is approximately 50 miles away. By virtue of its rarity and the distance to known occurrences, its occurrence in the project area is “unlikely” or “speculative,” but it occurs along the western edge of the California desert and in Arizona; hence, it occurs on both sides of the project area. If present, potential indirect effects include the spread of Sahara mustard and other invasive pest plants into dune habitat. Channel diversion and the interruption of aeolian and fluvial sediment transport could also adversely affect its persistence, if detected in the project area. (Ex. 2000, pp. 4.2-184 – 4.2-185.)

The PSPP Decision determined that the PSPP project’s contribution to the spread of Sahara mustard, which immediately threatens dunes and other sandy habitats, would be less than cumulatively considerable with the implementation of **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-14** (Weed Management Plan). The requirement for dune and wash compensation to occur locally (**BIO-20** and **BIO-21**) will minimize future fragmentation of flat-seeded spurge habitat in the Chuckwalla Valley (if present) by preventing future development and the indirect effects on weeds and fragmentation that accompany development. Impacts from the PSEGS are similar to those of the PSPP and these conditions of certification will minimize the impacts to flat-seeded spurge from the PSEGS to a less-than-significant level. (Ex. 2000, p. 4.2-185.)

### **Lobed Ground Cherry**

Lobed ground cherry is rare, threatened, or endangered in California, but more common elsewhere; the threat rank indicates that it is not very endangered in California. During the proceedings for the PSPP, it had a S Rank of 1.3, indicating that it was known from fewer than five viable occurrences in California, but the occurrences were somewhat stable. It has since been downgraded to a S Rank of 2, which indicates it is imperiled in California because of rarity due to very restricted range. Its Global rank of 5 indicates that it is relatively stable outside of California. It occurs largely on alkaline dry lake beds, but it has also been found in drier, less saline-alkaline environments on decomposed granitic soils in Mojave Desert scrub habitat. Due to its preference for lakebeds, mudflats, and desert sinks, and its apparent preference for alkaline and sub-alkaline habitats, evidence suggests that the northern and northeastern portions of the project have the highest potential for occurrence. It was not detected in these areas during fall 2010 surveys; however, surveys would be required along the two new proposed linear features. (Ex. 2000, p. 4.2-185.)

The PSPP found that impacts to this very rare species in California, if present, would be significant. Such an occurrence would also represent a range extension (i.e., occur at the periphery of its range in California). Potential indirect effects, if present, include the spread of Russian thistle and other alkaline-tolerant weeds into its habitat. Russian thistle is already present in the playa margin habitats and in the northeast portion of the

project area. Construction-related disturbance and vehicle use along the existing roads are common vectors for the spread of invasive pest plants. Even if found off site in the playa margins, it could be indirectly affected by alteration of the site hydrology or sedimentation. We would still consider impacts as described above to be significant if present at the PSEGS site. (Ex. 2000, p. 4.2-186.)

If present, implementation of the avoidance and compensatory mitigation requirements in sections C and D of **BIO-19** would reduce the project's impacts to the lobed ground cherry below significance. Since lobed ground cherry was downgraded to a Rank 2 as a consequence of detecting new occurrences and a low risk of extinction from other threats, then acquisition could include adjacent lakebed or other alkaline and sub-alkaline habitats that are at risk of development. If such lands are acquired within Chuckwalla Valley, as proposed in **BIO-20** (compensatory mitigation for dunes and MFTL habitat) and **BIO-21** (compensatory mitigation for desert washes), then the acquisition would minimize the threat of future fragmentation of remaining habitat surrounding the project. (Ex. 2000, p. 4.2-186.)

Implementation of **BIO-8** (Impact Avoidance and Minimization Measures) and **BIO-14** (Weed Management Plan), best management practices (BMP) and other measures in section A of **BIO-19** would reduce threats to lobed ground cherry and minimize the PSEGS project's contribution to the spread of Russian thistle and other weeds to a less-than-significant level. (Ex. 2000, p. 4.2-186.)

### **Indirect Impacts to Special-Status Plants**

The PSPP considered the following indirect impacts to special-status plants, (i.e., impacts outside the Project Disturbance Area or that occur following construction): introduction and spread of invasive plants; alteration of the surface hydrology and basic geomorphic processes that support rare plants and their habitat (e.g., disrupted aeolian and fluvial sand transport processes from obstructions or diversions); population fragmentation and disruption of gene flow; potential impacts to pollinators; increased risk of fire; erosion and sedimentation of disturbed soils that render the habitat vulnerable to invasion by pest plants; disturbance of the structure and ecological functioning of biological soil crusts that affect seed germination, reduce soil nutrition, carbon sequestration, and render the soil vulnerable to water and wind erosion; herbicide and other chemical drift; and disruption of photosynthesis and other metabolic processes from fugitive dust during construction and operation of the project. These impacts would be similar for the PSEGS. (Ex. 2000, p. 4.2-186.)

Although, the current design of the PSEGS project would allow flows to pass through the project, some disruption would still occur from roads and project facilities. However, because of the disruption of surface hydrology to downstream areas, flows would be

reduced compared to the PSPP; therefore, impacts to plants in these areas would be considered less than significant. (Ex. 2000, p. 4.2-187.)

Following construction, invasive species could occupy disturbed soils within the Project Disturbance Area and then spread into adjacent undisturbed habitats. Naturally disturbed habitats such as dunes and washes are particularly vulnerable to colonization by weeds. Sahara mustard is already present along roads and near the freeway. The primary conduit for spread, however, is along roads and transmission corridors. The dramatic increase in vehicle use of the project vicinity roads and construction of transmission corridors and new roads can increase the spread of this highly invasive wild land pest. Sahara mustard has shown a clear negative impact on native flora. Sahara mustard can form dense stands and potentially crowd out native annual plants. Sahara mustard plants growing early in the season may dominate available soil moisture that may adversely affect native annuals that start growing a little later in the season. (Ex. 2000, p. 4.2-187.)

Evidence indicates that throughout the life of the project, successional changes to vegetation may occur. As native vegetation is mowed, the regrowth will happen quickly and, after several years, may deplete nutrients in the soil. It is possible that the vigor of native plants may suffer, and invasive species that are tolerant of poor conditions may then proliferate. (Ex. 2000, p. 4.2-187.)

Mowing is anticipated to substantially decrease the quality of the vegetation as well as the value of the site for wildlife, and all remaining vegetation including wash vegetation will be mowed to 12-18 inches. Since vegetation will be managed by the project owner to facilitate use of the site and not to maintain vegetation on site, the analysis in evidence assumes a total loss of the function and value of the vegetation and habitats within the project site due to ongoing disturbance and other anthropogenic activities at the site that may continue to degrade habitat functions within the project footprint. Plants that are tolerant to disturbance may continue to occupy the site, however, leaving the vegetation on site may not be a benefit to these species due to ongoing risk of destruction or disturbance from construction equipment and operational work efforts including mowing, maintenance, and washing of the heliostats. (Ex. 2000, p. 4.2-187.)

Tamarisk, Russian thistle, Sahara mustard and Mediterranean grasses are already present in the project area and are expected to increase as a result of construction and operation-related disturbance. The proliferation of many non-native plants has dramatically increased the fuel load and frequency of fire in many desert ecosystems. Unlike other ecosystems in California, fire was not an important part of the Mojave Desert ecosystem; most perennials are poorly adapted to even low-intensity fires and the animals that coevolved are not likely to respond favorably to fire either. The potential spread or proliferation of non-native annual grasses combined with the proximity to

ignition sources could potentially increase the risk of fire. The effects to these poorly adapted desert communities would be harmful, particularly to cacti and most native shrub species. Burned creosote and other native shrubs are typically replaced by short-lived perennials and non-native grasses. The spread of invasive plants is a major threat to biological resources in the Colorado Desert because non-native plants can displace native plants, increase the threat of wildfire, and supplant wildlife foods that are important to herbivorous species. (Ex. 2000, p. 4.2-188.)

Wildfires (caused by construction or downed transmission lines) are rare, but the increase in daily vehicle use in the area from an anticipated 100 new jobs during operation and up to 998 jobs during construction could significantly increase the risk of ignition. Other temporary and permanent impacts from the project could occur to surrounding vegetation communities from grading activities creating air-borne, fugitive dust, sedimentation, and erosion that would disrupt photosynthesis and other metabolic processes. The destruction of plants and soil crusts by windblown sand and dust also exacerbates the erosion of the soil and accelerates the loss of nutrients. (Ex. 2000, pp. 4.2-188; 4.10-7, 4.10-10.)

Indirect impacts to sensitive plants would be significant absent mitigation. Implementation of the following mitigation measures will reduce project impacts to less-than-significant levels: avoidance and minimization measures (**BIO-8**); compensating for habitat loss by preventing the future development of desert lands through acquisition and permanent protection under conservation easements; management of these lands to sustain enhanced populations of sensitive species and habitats (**BIO-12**, **BIO-19**, **BIO-20**, and **BIO-22**); focusing the acquisitions into important linkages for species dispersal into critical refugia; restoring degraded portions of acquired lands (**BIO-12** and **BIO-19**); and minimizing the size of the disturbance area along the linears (**BIO-8** and **BIO-19**).

### **Impacts of Climate Change to Plants**

Anticipated climate change is projected to cause greater than 80 percent reduction in range size for up to 66 percent of California's endemic species within a century. Projected reductions depend on the magnitude of future emissions and on the ability of species to disperse from their current locations. California's varied terrain could cause species to move in very different directions, breaking up present-day floras. However, these projections also identify regions where species undergoing severe range reductions may persist. Protecting these potential future refugia and facilitating species dispersal will be essential to maintain biodiversity in the face of climate change. Many of these areas are already in some degree of federal wilderness protection. However, the value of these refugia depends critically on the ability of species to disperse, underscoring the importance of landscape connectivity and potential restoration in the

face of increasing urbanization, land use change, and disturbance. (Ex. 2000, pp. 4.2-188 – 4.2-189.)

The PSEGS project is expected to contribute to a cumulative reduction in greenhouse gases. However, the benefits gained by the project's reduction in greenhouse gases must also be weighed against the potential loss of carbon sequestration benefits from the desert vegetation. In order to build the facility, the plants, animals and soil of the native desert acreage are damaged and destroyed, which releases CO<sub>2</sub>. Presently, there is still dispute among scientists as to how to accurately measure the benefits and the loss. (Ex. 2000, p. 4.2-189.)

### **Biotic Soil Crusts and Other Carbon Sinks**

Numerous studies conducted over the past 40 years have attempted to identify and quantify the major pools of carbon uptake for the various components of desert ecosystems as well as desert ecosystems as a whole. The estimates of carbon uptake vary immensely between sites and researchers. In addition to vegetation, alkaline soils and biological soil crusts (BSCs), which are composed primarily of photosynthetic cyanobacteria, algae, lichens, and mosses, play a key role in arid and semi-arid ecosystems and are able to fix carbon. However, those pools of carbon that biological crusts fix are relatively small. New evidence suggests alkaline desert soils may be responsible for considerable uptake of carbon. Although there is much uncertainty regarding where and how carbon is stored in desert ecosystems, evidence suggests desert soils have the potential to be a carbon sink. Whether a result of biotic crusts, vegetation, alkaline soils, or an increase in average precipitation, the rate of carbon absorption in the soil has scientists considering whether desert ecosystems play a more critical role in the carbon cycle than previously believed. (Ex. 2000, p. 4.2-189.)

The Center for Biological Diversity (CBD) argues that surveys of cryptobiotic soils are required under CEQA, but cites no law. (CBD Opening Brief, p. 30.) There is currently no acceptable means to quantify the sequestration occurring on the project site. Evidence suggests that implementation of the conditions of certification for the PSEGS project would reduce potential adverse effects from the loss of carbon sequestration. These include avoidance and minimization measures (**BIO-8**), compensating for habitat loss by preventing the future development of desert lands through acquisition and permanent protection under conservation easements (**BIO-12**, **BIO-19**, **BIO-20** and **BIO-22**), focusing the acquisitions into important linkages for species dispersal into critical refugia, restoring degraded portions of acquired lands (**BIO-12** and **BIO-19**), minimizing the size of the disturbance area along the linears (**BIO-8** and **BIO-19**), and revegetating after closure (**BIO-23**). (Ex. 2000, pp. 4.2-189 – 4.2-190.) We are satisfied that the impacts PSEGS may have on cryptobiotic soils are mitigated to below significance after implementation of the above-mentioned conditions of certification.

Further, the matter was adjudicated in the PSPP Decision; therefore, the issue falls beyond the scope of the amendment. (Public Resources Code, section 21166, CEQA Guidelines 15162 and 15163. See also *Black Property Owners Association v. City of Berkeley* (1994) 22 Cal.App.4th 974; *Benton v. Board of Supervisors* (1991) 226 Cal.App. 1467, *Temecula Band of Luiseno Mission Indians v. Ranch California Water Dist.* (4<sup>th</sup> Dist. 1996) 43 Cal.App.4th 425.

### **Cacti, Yucca, and Native Trees**

Northern California barrel cactus, cottontop cactus, or hedgehog cactus were detected on site. However, a total of three species in the Cactaceae family were observed during 2013 field surveys including silver cholla, pencil cholla, and common fishhook cactus. These species were found both along the generation tie-line corridor and the natural-gas-line corridor with the greatest numbers found along the north-south portion north of I-10. Native trees found during 2013 field surveys included ironwood, blue palo verde, and catclaw acacia (*Senegalia greggii*). (Ex. 2000, p. 4.2-190.)

Condition of Certification **BIO-8** (Impact Avoidance and Minimization Measures) requires preparation and the salvaging of topsoil and native desert plants to aid in the revegetation of temporarily disturbed areas following project construction. Weed management measures are incorporated into **BIO-14** (Weed Management Plan). Restoration and revegetation of the solar facility and other permanently disturbed areas upon closure is addressed separately in **BIO-22**. Taken together, these conditions render any impacts to cacti, yucca or native trees insignificant. (Ex. 2000, p. 4.2-190.)

### **Special-status Reptilian Species**

#### Desert Tortoise

##### Direct Impacts

Protocol-level surveys for Desert Tortoise were conducted for the PSPP project site and linear facilities between March 17, and May 22, 2009 (study area except substation) and October 24, to October 25, 2009 (substation site and buffer). Clearance surveys were conducted on portions of the PSPP project site in 2010. Surveys conducted in 2009 detected 17 burrows (Class 3–5), 15 tortoise pallets (Class 4 or 5), and 19 tortoise shell remains (Class 5) in the project area. Surveys conducted in 2010 identified seven tortoises (adult and juvenile) in the project area, including four along the generation tie line, and three tortoises south of I-10, the latter being outside of the Project Disturbance Area and buffer area. Only one tortoise was detected in the Project Disturbance Area along the generation tie line for the PSPP project. Desert tortoises were not detected on the PSPP solar field. (Ex. 2000, p. 4.2-109.)

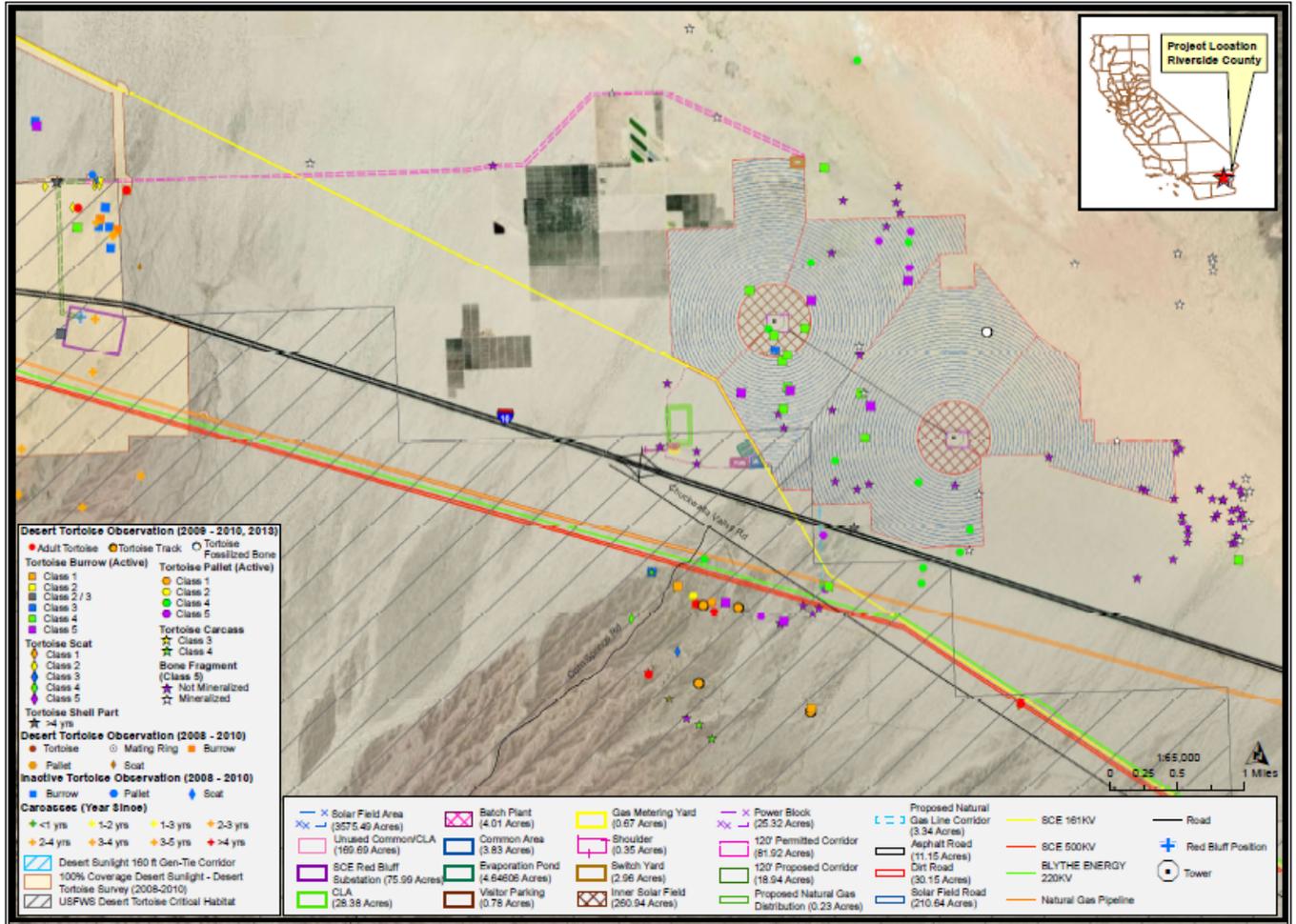
Protocol surveys for Desert Tortoise were conducted for the PSEGS project from April 7, to April 30, 2013. These surveys were limited to areas not previously surveyed for the PSPP project and included portions of the generation tie-in and the new natural-gas pipeline alignment. Desert tortoises were not detected during these surveys. Two Desert Tortoise burrows showing sign of recent occupation were detected on the generation tie-in south of I-10 and a possible burrow was noted in a survey buffer north of the freeway. (Ex. 2000, p. 4.2-109.)

Evidence indicates that in public workshops, status reports, and in a comment letter on the PSA, the CBD raised concerns regarding the age of the Desert Tortoise surveys for the PSEGS project, contending that the surveys were out of date and not in conformance with guidelines identified by the USFWS. Staff testified that they considered the age of the surveys and coordinated with agency Staff during preparation of the PSA and FSA. The guidelines identified in the Desert Tortoise Recovery Plan are recommendations when working in Desert Tortoise habitat to facilitate permitting. (Ex. 2000, pp. 4.2-109, 4.2-223.)

Although Desert Tortoises were not detected on the project site, this species is known to occur in the project region. Desert tortoise sign is present on the project site and the species has been periodically detected in adjacent habitat. In addition, for the PSPP project resource, agency Staff located a possible Desert Tortoise burrow near the bridge associated with the large wash that flows into the center of the Project Disturbance Area. Potential Desert Tortoise burrows were noted by Staff during reconnaissance level surveys of the project area during April 2010 and April 2013. Additional observations of Desert Tortoise from project buffers for the PSPP project were included in the Revised Desert Tortoise Technical Report. **Biological Resources - Figure 1** identifies Desert Tortoise sign detected by the project owner during surveys of the PSPP and PSEGS project site. (Ex. 2000, p. 4.2-110.)

# Biological Resources - Figure 1

Palen Solar Electric Generating System - Desert Tortoise



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION

SOURCE: SOURCE: Bing Aerial, BrightSource - May 2013, OpenStreetMap - May 2013, CEC Transmission Line, Natural Gas Line - June 2013

Although Desert Tortoise were not detected on the solar field and only a small number of Desert Tortoises were detected in the buffer area, it is likely that the project area supports Desert Tortoise that were not observed by the surveyors. Desert tortoises are frequently unavailable to be sampled by field crews because they make extensive use of underground shelters. Similarly, Desert Tortoises spend much of the year in burrows even during the active season, and only the proportion of the tortoise population that is above ground is usually sampled. At the Marine Corps Air Ground Combat Center near Twentynine Palms, a study conducted in 1999 found that during the spring, Desert Tortoises were located above ground 45 percent of the time in a productive year, compared with only 20 percent in a drought year. They further noted that surface activity declined from spring levels in the summer of both years, yet the difference between years was still significant. Desert tortoises were located on the surface 26 percent of the time in the productive year and 11 percent of the time in the drought year. Even when Desert Tortoise are active and above ground during the surveys, only a subset of these animals are usually detected. This can lead to a violation of a critical assumption of the line distance sampling technique, namely, that all animals on the line are found. (Ex. 2000, p. 4.2-110.)

In order to account for observer bias, weather conditions, and Desert Tortoise behavior, the USFWS developed a predictive model for estimating the expected range of Desert Tortoise that may be present based on the limited ability to detect animals during the surveys. The USFWS 2010 survey protocol takes into account the probability that tortoises would be present above ground based on the previous winter's rainfall and the fact that not all tortoises within the survey area are seen by surveyors. The model then provides a mathematical formula that is used to estimate the number of adult and sub-adult tortoises that are actually present. Statistical techniques can provide further estimates of minimum and maximum numbers of tortoises expected within a 95 percent confidence interval. In addition, most juvenile tortoises and tortoise eggs are not detected during field surveys. The use of this model requires the detection of live adult or sub-adult Desert Tortoise, neither of which was detected on the proposed solar field. The absence of live tortoise data limits the ability of the model to provide statistically defensible estimates of Desert Tortoise density. Similarly, the fact that living Desert Tortoises were not detected during surveys does not suggest that Desert Tortoises are not present on the project site. Review of range-wide data, existing site conditions and historic disturbance, and the results of the surveys completed to date, suggest the site is expected to support a relatively low number of Desert Tortoise. (Ex. 2000, p. 4.2-110.)

In a comment letter on the PSA, the CBD raised concerns regarding the estimates of Desert Tortoise that may occur on the PSEGS project site. To support the preparation of the Biological Opinion (BO) for the approved PSPP project, the USFWS used Desert

Tortoises found in the buffer transects of the generation tie-in and regional estimates to estimate tortoise density for the project (Ex. 1017). Based on this information, the USFWS concluded that two to twelve sub-adult or adult tortoises occupy the project site. In addition to adult and sub-adult Desert Tortoises, the project site is expected to support a population of juvenile tortoises that are not considered in the USFWS formula. (Ex. 2000, p. 4.2-110.)

Juvenile tortoises are extremely difficult to detect because of their small size and cryptic nature. In many instances juveniles are overlooked during surveys. However, estimates of juvenile tortoise populations can be extrapolated using information based on a four-year study of tortoise population ecology conducted in 1987. This study determined that juveniles accounted for approximately 31.1 to 51.1 percent of the overall tortoise population. Using this range, the USFWS estimated between four and six juvenile Desert Tortoises may occur on the project site. The project site may also support the eggs of Desert Tortoise. The number of tortoise eggs that could be present on the project site was estimated by the USFWS based on the assumption of a 1:1 sex ratio and that all females present would lay eggs in a given year. Applying the 1:1 sex ratio, six out of the 12 Desert Tortoises could be reproductive females. Given one clutch per reproductive female in a given year multiplied by the average number of eggs found in a clutch, approximately 35 eggs would be expected to occur in a given year. However, fewer eggs are likely to be on site at any given time because not all females are expected to be of reproductive age or elected to produce eggs during any given year. (Ex. 2000, p. 4.2-111.)

**Biological Resources - Table 4**  
**Estimated Number of Desert Tortoise on the Project Site and**  
**Linear Facilities**

Adult and Sub-adults*		Juvenile Estimates*		Eggs*	Total Adult/Sub-adult and Juvenile	
Lower	Upper	Lower	Upper		Lower	Upper
2	12	3	6	35	5	18

\*All estimates of Desert Tortoise abundance are based on values identified in the 2011 Biological Opinion for the Approved PSPP.

As part of its authority granted by the Warren-Alquist Act, the Energy Commission has in-lieu permitting authority for local and state agencies; therefore, the State Incidental Take Permit for Desert Tortoise would be subsumed in the Commission Final Decision. Energy Commission Staff testified that the USFWS 2011 Biological Opinion for the approved PSPP project provided a reasonable estimate of the expected number of

Desert Tortoise that may occur on the PSEGS site. We note that this data are based on the extrapolation of existing information because the evidence indicates that live Desert Tortoises were not detected during the surveys. The actual number of Desert Tortoises that may occur in the Project Disturbance Area is likely much lower. The actual number of Desert Tortoise encountered on the site, if any, will be quantified during pre-construction clearance surveys and monitoring during construction of the facility. (Ex. 2000, p. 4.2-111.)

During construction of the project, Desert Tortoises may be harmed during clearing, grading, and trenching activities or may become entrapped within open trenches and pipes. Construction activities could also result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicles or heavy equipment. Other direct effects could include individual tortoises being crushed or entombed in their burrows, collection or vandalism, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise or vibrations from the heavy equipment, and injury or mortality from encounters with workers' or visitors' pets. Desert tortoises may be attracted to the construction area by application of water to control dust, placing them at higher risk of injury or mortality. Increased human activity and vehicle travel would result from the construction and improvement of access roads, which could disturb, injure, or kill individual tortoises. Tortoises may seek shade and thermal cover by taking shelter under parked vehicles and can be killed, injured, or harassed when the vehicle is moved. (Ex. 2000, p. 4.2-111 – 4.2-112.)

Use of paved roads including I-10 and dirt access roads could result in mortality of Desert Tortoises by vehicle strikes. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest. Desert tortoises on dirt roads may be affected depending on vehicle frequency and speed. Data indicates that Desert Tortoise numbers decline as vehicle use increases and that tortoise sign increases with increased distance from roads. (Ex. 2000, p. 4.2-112.)

Construction activities that result in accidental fires can directly affect Desert Tortoise and their habitat. Because of the abundance of weeds in the region, wildfires that result from welding, vehicles carelessly parked on vegetation, smoking, or other ignition sources pose a potential direct impact to Desert Tortoise and can quickly spread to off-site areas. Direct effects of fire on Desert Tortoise include mortality by incineration, elevating body temperature, poisoning by smoke, and asphyxiation. Small individuals such as hatchlings are more at risk from lethal heating than large ones because they have a higher surface-to-volume ratio that allows heat to penetrate their vital organs relatively quickly. (Ex. 2000, p. 4.2-112.)

Mitigation includes impact avoidance and minimization measures to reduce these impacts to Desert Tortoise, including installation of exclusion fencing to keep Desert

Tortoise out of construction areas, translocating the resident Desert Tortoise from the project site, controlling construction traffic, reducing speed limits to decrease the incidence of road kills, and worker environmental awareness training programs. (Ex. 2000, p. 4.2-112.)

This mitigation is incorporated into conditions of certification for the PSPP and PSEGS. Conditions of Certification **BIO-1** through **BIO-5** require qualified biologists with authority to implement mitigation measures be on site during all construction activities. Condition of Certification **BIO-6** requires the development and implementation of a Worker Environmental Awareness Program to train all workers to minimize impacts to sensitive species and their habitats. Condition of Certification **BIO-7** requires the project owner to prepare and implement a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that incorporates the mitigation and compliance measures required by local, state, and federal LORS regarding biological resources. Condition of Certification **BIO-8** describes BMP and other impact avoidance and minimization measures. (Ex. 2000, p. 4.2-112 – 4.2-113.)

Conditions of Certification **BIO-9** through **BIO-11** are specific to Desert Tortoise. Condition of Certification **BIO-9** requires installation of security and Desert Tortoise exclusionary fencing around the entire Project Disturbance Area and on portions of I-10 south of the project area. **BIO-10** requires the development and implementation of a Desert Tortoise relocation/translocation plan to move any Desert Tortoises found in the Project Disturbance Area to identified relocation or translocation sites. Condition of Certification **BIO-11** requires verification that all Desert Tortoise impact avoidance, minimization, and compensation measures have been implemented. These conditions are consistent with the Commission's Decision for the PSPP. (Ex. 2000, p. 4.2-113.)

Implementation of Conditions of Certification **BIO-9** and **BIO-10** have inherent risks and could themselves result in effects such as mortality, injury, or harassment of Desert Tortoises due to equipment operation, fence installation activities, removal of tortoise burrows, and tortoise relocation/translocation. These impacts are described in more detail below. (Ex. 2000, p. 4.2-113.)

### **Impacts to Critical Habitat**

The project area overlaps a portion of the Chuckwalla Desert Tortoise Critical Habitat Unit (Chuckwalla CHU). The Chuckwalla CHU is 1,020,600 acres, and 228 acres would be directly or indirectly impacted by the PSEGS project. The functions and values of Desert Tortoise critical habitat north of I-10 are relatively low; however, the presence of Desert Tortoise in this area has been detected. Habitat south of I-10 is better for Desert Tortoise and generally increases with proximity to the Chuckwalla Mountains. (Ex. 2000, p. 4.2-113.)

The critical habitat area overlapping with the project site contains at least three sizeable washes with major bridges that provide for dispersal and long-term gene flow across I-10, which is needed to achieve population connectivity between the Chuckwalla and Chemehuevi critical habitat units. Although I-10 has disrupted the hydrology and associated microphyll woodland components of the lesser washes, the shrub and herbaceous annual vegetative components between the washes remain hydrologically unaffected and support comparable community characteristics with areas south of I-10. Since Desert Tortoise forage predominantly on annual plants, the hydrologic effects on the tree canopy do not affect foraging habitat characteristics. Therefore, while the habitat in this area may be considered low quality, the area is occupied (based on the presence of sign) and provides a vital role and function of the critical habitat designation for maintaining inter-DWMA population connectivity espoused in the species' recovery plan (USFWS 1994a). (Ex. 2000, p. 4.2-113.)

Although the three major culverts under I-10 would remain open to Desert Tortoise movement, the project would disrupt local movement patterns by forcing tortoises to walk around the project site. Thus, tortoises north of the project site attempting to move in a southward direction would be diverted to the east or west, and the perimeter fencing around the project site would direct tortoises towards I-10 on the traffic surface. Tortoise-proof fencing has not been installed along this segment of I-10, so Desert Tortoises moving around the project site rather than moving through washes would potentially experience increased rates of vehicular-related mortality. Increased mortality would further reduce local population levels and increase the adverse effects of habitat fragmentation by preventing dispersal between the Chuckwalla Mountains to the southwest and Palen Mountains to the northeast. The potential increase in Desert Tortoise road fatalities would be a significant impact of the project. This impact would be reduced to less-than-significant levels with installation of Desert Tortoise exclusion fencing along I-10 south of the project site as described in Condition of Certification **BIO-9** (Desert Tortoise Clearance Surveys and Fencing). Fencing is consistent with guidance in the NECO, which specifies that "Interstate Highways 40 and 10 would be fenced by Caltrans along their common boundaries with DWMA's to preclude tortoise mortality and limit other wildlife mortality." (Ex. 2000, p. 4.2-113 – 4.2-114.)

### **Impacts of Relocation/Translocation**

For many projects the regulatory agencies require that Desert Tortoises be captured and relocated from the development site. This relocation is defined as "translocation" if a Desert Tortoise is moved more than a certain distance from its current location (i.e., typically greater than 500 meters/1642 feet). Although Desert Tortoises were not found on the project site, it is likely that a low number of Desert Tortoises are present. If detected during clearance surveys, Desert Tortoises will require translocation to off-site locations. (Ex. 2000, p. 4.2-114.)

Large scale land acquisition to support military training, residential and commercial development, and the construction of industrial level solar infrastructure projects has necessitated the use of translocation as a tool to minimize direct losses to Desert Tortoise and other sensitive wildlife. Construction of the proposed project would require the translocation or removal of all Desert Tortoises, including adults, sub-adults, and any juveniles that are found on the site during clearance surveys. An important consideration in assessing potential impacts from the translocation effort is establishing the proposed translocation sites. Translocation and control sites should occur on lands that can be managed for the protection of this species. The translocation of animals to privately held lands is not recommended by the BLM, USFWS, and CDFW, given the threat of future development and other inherent risks to Desert Tortoise associated with private land. The primary and secondary recipient sites identified for the approved PSPP project were located on roughly 11,129 ha (27,500 ac) of the BLM lands in the Chuckwalla DWMA along the upper bajadas on the north side of the Chuckwalla and Little Chuckwalla Mountains. Staff expects that additional information on the proposed translocation sites will be developed as part of the revised Desert Tortoise Translocation Plan prepared as part of **BIO-10**. (Ex. 2000, p. 4.2-114.)

The distance of the translocation site from the project site also affects the methods used during the implementation of the plan. USFWS may require disease testing and quarantine for any tortoise translocated more than 500 meters (1642 feet). This requirement is intended to limit the potential exposure risk to healthy tortoises adjacent the project site. However, for each Desert Tortoise translocated to a long distance site, two other tortoises must be handled, disease tested, and radio tagged. Therefore, a total of three tortoises are handled for each translocation event. Desert tortoises at the recipient site and control site are disease tested and radio tagged in order to ensure that healthy animals are not being introduced into a diseased population and to track the animals post-release. In addition, disease testing and radio tagging allows the agencies to track the mortality of translocated versus host or control populations, provides long term monitoring of the populations, and provides a mechanism for evaluating whether mortality occurs uniformly across the three groups. (Ex. 2000, p. 4.2-114.)

The USFWS may limit the maximum number of Desert Tortoises that may be relocated to a particular area to minimize potential effects to the host population from resource competition. Translocation of Desert Tortoise has inherent risks that must be considered when implementing this activity. Capturing, handling, and relocating Desert Tortoises could result in harassment, injury, or mortality of Desert Tortoises. Impacts of translocation may include elevated stress hormone levels, changes in behavior and social structure dynamics, genetic mixing, increased movement (caused by antagonistic behavior with other tortoises, avoidance of predators or anthropogenic influence, homing, or seeking out of preferred habitat), spread of disease, and increased

predation. Handling, holding, and transport protocols may also compound with abiotic factors to affect the outcome for translocated individuals, particularly during extreme temperatures, or if they void their bladders. Tortoises that void their bladders during handling have significantly lower overall survival rates (0.81-0.88) than those that did not void (0.96). Desert tortoises that are improperly handled by biologists without the use of appropriate protective measures may be exposed to pathogens that spread among tortoises in both resident and translocated animals. The introduction of diseased tortoises to a recipient site or holding pen may result in the spread of upper-respiratory tract disease (URTD). The USFWS considers URTD to be one of the most serious infectious diseases affecting Desert Tortoises. (Ex. 2000, p. 4.2-115.)

As of 2013, there are a number of ongoing translocation actions that are underway. Most of these translocation events are related to military land expansion and solar energy development, although a large scale translocation event is planned to occur on the BLM lands near Pahrump, Nevada. Definitions of success are variable and determining ultimate success can require lengthy studies. For the PSEGS project, translocation is considered a mechanism to salvage existing animals and place them in an area where they have the potential to survive post construction. (Ex. 2000, p. 4.2-116.)

Success rates of herpetofauna translocations range from 14 percent to 42 percent, suggesting that improved efforts are essential for the future recovery of many reptiles and amphibians. Existing studies suggest that animals move away from the translocation site and move through the landscape at a higher rate than control animals. More specifically, a review of 91 herpetofauna translocation projects reported the primary causes of translocation failure were homing response by translocated individuals and poor habitat in translocated areas, followed by human collection, predation, food and nutrient limitation, and disease. The risks and uncertainties of translocation to Desert Tortoises are well recognized in the Desert Tortoise scientific community. (Ex. 2000, p. 4.2-116.)

However, many translocations of Desert Tortoises have been limited in scope and applicability; shortcomings have included small sample size, loss of tortoises by death, poaching, transmitter failure, limited sampling period, inadequate information on resident tortoises, variation in release techniques or timing of releases, and use of captive or penned tortoises. In a study conducted over four years at Fort Irwin, the USGS observed highly variable mortality rates ranging from 34 percent in 2009 to 1.5 percent in 2011. The tortoise mortality rate for 2011 continued to decrease from previous years despite an increase in the number of tortoises being monitored. **Biological Resource - Table 5** provides a summary of the data taken from the 2011 USGS study at Fort Irwin, California. (Ex. 2000, p. 4.2-116 4.2-117.)

**Biological Resource - Table 5**  
**Desert tortoise mortality from 2008-2011 at the Ft. Irwin Study Site.**

Study Year	Number Dead	Number Monitored	Percent Mortality
2008	39	121	32.2
2009	31	90	34.4
2010	11	82	13.4
2011	8	525	1.5

(Ex. 2000, p. 4.2-117.).

This study suggested that the majority of Desert Tortoise mortality could be attributed indirectly to predation. In times of drought when predators (e.g. coyotes, Kit Foxes, and bobcats) have fewer mammalian prey items available, they increase take of less preferred prey, including Desert Tortoises. During droughts, coyotes apparently killed most of the tortoises in one study at the Desert Tortoise Natural Area, and 21 to 28 percent of the marked wild population in a study near Ridgecrest, California were killed by canids. Periods of drought may directly influence tortoise survivorship leading to regional population declines. (Ex. 2000, p. 4.2-117.).

While data suggests that translocation may be an effective tool for salvaging Desert Tortoise from large scale land use projects, the implementation of translocation activities must be completed in a thorough and well-coordinated manner. To provide guidance for these actions, the USFWS prepared specific draft guidelines for clearance and translocation of Desert Tortoises from the project sites. This included the *Translocation of Desert Tortoises (Mojave Population) From Project Sites: Plan Development Guidance*. This document provides guidance including the timing of relocation/translocation, disease testing requirements, and other actions intended to minimize impacts to Desert Tortoise. (Ex. 2000, p. 4.2-117.).

**Biological Resources - Table 6** (Desert Tortoise Density Estimates and Impact Summary) estimates of the numbers of tortoises that may be translocated from the project site, numbers of tortoises that may be handled at the translocation and control sites, and numbers of undetected juveniles and eggs that may occur at the project site. These figures are based on the values provided in the 2011 USFWS Biological Opinion for the approved PSPP project. Because no living Desert Tortoises were identified on the proposed solar field, the actual number of Desert Tortoises that require translocation from the Project Disturbance Area is expected to be lower than the values identified in **Biological Resources - Table 6**. (Ex. 2000, p. 4.2-118.)

**Biological Resources - Table 6  
Desert Tortoise Density Estimates and Impact Summary**

Project Feature	Estimated Number of Tortoises Subject to Direct Project Effects*						
	Adult and Sub-adults		Juvenile Estimates		Eggs	Total Adult/Sub-adult and Juvenile	
	Lower	Upper	Lower	Upper		Lower	Upper
Project Site	2	12	3	6	35	5	18
Translocation Area <sup>2</sup>	2	12	3	6	N/A	5	18
Control Area <sup>3</sup>	2	12	3	6	N/A	5	18
Subtotal	6	36	9	18	N/A	15	54

\*\*All estimates of Desert Tortoise abundance are based on values identified in the 2011 Biological Opinion for the Approved PSPP. (Ex. 2000, p. 4.2-118.)

As described in **Biological Resources - Table 6** (Desert Tortoise Density Estimates and Impact Summary), approximately 2 to 12 adult or sub-adult Desert Tortoises, 3 to 6 juvenile tortoises, and 35 eggs have the potential to occur on the proposed project site. The actual number of animals that may be subject to translocation is expected to be a subset of this value. It is estimated that only 15 percent of juvenile tortoises (0.15 multiplied by the number of juveniles) on the site would be located during clearance surveys. (Ex. 2000, p. 4.2-118.)

There are inherent risks to any action that requires the handling, disease testing, and translocation of Desert Tortoise. For the PSEGS project, these risks could occur in the translocated, host, and the control population. Although Desert Tortoises will not be translocated into the control population, some mortality may occur from handling or, if used, from the placement of GPS tracking devices. For example, mortality at control populations is expected to be approximately 5 percent based on a review of scientific studies of tortoise mortalities associated with routine handling. (Ex. 2000, p. 4.2-118.)

Translocation mortality rates are assumed to range up to 45 percent for the PSEGS project. This value represents the high end of documented translocation mortality for Desert Tortoise at this time. Using the 5 percent mortality rate for the control population (adult and juvenile tortoises multiplied by 0.05) and the 45 percent mortality rate for the translocated and host populations (adults and juveniles multiplied by 0.45), this would result in the potential loss of between 5 and 20 tortoises from translocation mortality. All

of the 35 eggs would be lost. If fewer Desert Tortoises are discovered or mortality rates are lower, there would be a corresponding reduction in Desert Tortoise deaths from translocation activities. (Ex. 2000, p. 4.2-118.)

Condition of Certification **BIO-10** requires development of a Desert Tortoise Translocation Plan in consultation with the BLM, USFWS, and CDFW. The Desert Tortoise Translocation Plan would include the identification and prioritization of potentially suitable locations for translocation, Desert Tortoise handling and transport considerations (including temperature), animal health considerations, a description of translocation scheduling, site preparation and management, and specification of monitoring and reporting activities for evaluating success of translocation. With implementation of Condition of Certification **BIO-10**, adverse impacts associated with Desert Tortoise translocation will be minimized to below significance. (Ex. 2000, p. 4.2-119.)

### **Mitigation for Desert Tortoise Habitat Loss**

The PSEGS project will cause the direct and indirect loss of approximately 3,948 acres of Desert Tortoise habitat. Construction will also cause the fragmentation and disturbance to adjacent habitat. These impacts are significant and require compensatory mitigation. With the exception of the dune areas, Desert Tortoise habitat is present across most of the PSEGS project site. Habitat conditions vary on the site and generally consist of low-to-moderate quality habitat. Historic military training, agriculture, the spread of exotic plants, construction of I-10 and the large wing-dykes near the foothills of the Chuckwalla Mountains have contributed to the decline of habitat conditions on the project site. The evidence indicates that little of the habitat quality within the Project Disturbance Area could be described as high quality, but all of it is suitable for Desert Tortoise and all could be potentially occupied. (Ex. 2000, p. 4.2-119.)

The approved PSPP project set a compensatory mitigation ratio of 5:1 for disturbance to critical habitat and a 1:1 ratio for areas outside of critical habitat. The record shows that Staff from the BLM, Energy Commission, USFWS, and CDFW agree that compensatory mitigation at these ratios is appropriate for the PSEGS project because the project would eliminate Desert Tortoise habitat, fragment adjacent habitat, and adversely affect connectivity for Desert Tortoise and other wildlife. The compensation ratio for the BLM is determined by its bioregional land use plan rather than the specific effects of the PSEGS project on Desert Tortoise. (Ex. 2000, p. 4.2-119.)

### **Calculation of Security for Desert Tortoise Compensatory Mitigation**

The Renewable Energy Action Team (REAT) agencies have developed a total cost accounting method for calculating acquisition or conservation easement costs for mitigation lands, as shown in **Biological Resources - Table 7** below. This method provides an estimate of security costs for mitigation and includes the costs associated

with the purchase transactions, appraisal, escrow, and title insurance, including mineral, oil, and gas rights. The estimate also addresses costs of initial enhancement (e.g., signs, fencing, and boundary/property line surveys or restoration actions such as removal of exotic species, and roads), management for ongoing activities such as public access and enforcement, and monitoring the implementation, effectiveness, and compliance of conservation measures with the goals and objectives of the mitigation. For those projects using the REAT mitigation account for implementing mitigation actions, the budget includes administration of contracts and reporting. (Ex. 2000, p. 4.2-122.)

**Biological Resources - Table 7**  
**REAT Biological Resources Mitigation/Compensation Cost Estimate Calculation Table for PSEGS<sup>1</sup>**

	Desert Tortoise Compensation	Mojave Toed Habitat	Fringe Lizard	Burrowing Owl	Streambed Compensation
Number of Acres	4,860	2063.5		78	788
Estimated number of parcels to be acquired, at 160 acres per parcel <sup>2</sup>	30	13		1	5
Land cost at \$1000/acre <sup>3</sup>	\$ 4,860,000	\$2,063,700		\$78,000	\$788,000
Level 1 Environmental Site Assessment at \$3000/parcel	\$91,925	\$38,694		\$3,000	\$14,775
Appraisal at no less than \$5,000/parcel	\$ 151,875	\$64,491		\$5,000	\$24,625
Initial site work - clean-up, restoration or enhancement, at \$250/acre <sup>4</sup>	\$1,215,00	\$515,925		\$19,500	\$197,000
Closing and Escrow Cost at \$5000 for 2 transactions <sup>5</sup>	\$151,875	\$64,490		\$5,000	\$24,625
Biological survey for determining mitigation value of land (habitat based with species specific augmentation) at \$5000/parcel	\$151,875	\$64,490		\$5,000	\$24,625
3rd Party Administrative Costs (Land Cost x 10%) <sup>6</sup>	\$486,000	\$206,370		\$7,800	\$78,800

Agency cost to accept land donation <sup>7</sup> (Land Cost x 15%) x 1.17 (17% of the 15% for overhead)	\$852,930	\$362,179	\$13,689	\$138,294
Subtotal of Acquisition and Initial Site Work	\$7,960,680	\$3,380,341	\$136,989	\$1,290,744
Long-term Management and Maintenance (LTMM) fee at \$1450/acre <sup>8</sup>	\$7,047,000	\$2,992,365	\$113,100	\$1,142,600
Management Fees				
Establish Project Specific Account <sup>9</sup>	\$12,000			
Call for and Process Pre-Proposal Modified RFP or RPF <sup>10</sup>	\$30,000			
Management fee for Acquisition and Enhancement Actions (Subtotal x 3%)	\$235,820	\$101,410	\$4,109	\$38,722
Management Fee for LTMM account (LTMM x 1%)	\$70,470.00	\$29,924	\$1,131	\$11,426
Subtotal of Management Fees	\$351,290	\$131,334	\$5,240	\$50,148

TOTAL Estimated cost for deposit in project specific sub-account	\$ 15,358,970	\$6,504,039	\$255,330	\$2,483,492
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1. All costs are calculated based on the REAT Biological Resources Mitigation/Compensation Cost Estimate table (July 23, 2010) and are best estimates as of summer 2010. Actual costs will be determined at the time of the transactions and may change the funding needed to implement the required mitigation obligation. Note: regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
2. For the purposes of determining costs, a parcel is defined at 160 acres, recognizing that some will be larger and some will be smaller, but that 160 acres provides a good estimate for the number of transactions anticipated (based on input from CDD).
3. Generalized estimate taking into consideration a likely jump in land costs due to demand, and an 18-24 month window to acquire the land after agency decisions are made. If the agencies, developer, or 3rd party has better, credible information on land costs in the specific area where project-specific mitigation lands are likely to be purchased, that data overrides this general estimate. Note: regardless of the estimates, the developer is responsible for providing adequate funding to implement the required mitigation.
4. Based on information from CDFW.
5. Two transactions at \$2500 each: landowner to 3rd party; 3rd party to agency. The transactions will likely be separated in time.
6. Includes Staff time to work with agencies and landowners; develop management plan; oversee land transaction; organizational reporting and due diligence; review of acquisition documents; assembling acres to acquire....)
7. Includes agency costs to accept the land into the public management system and costs associated with tracking/managing the costs associated with the donation acceptance, including 2 physical inspections; review and approval of the Level 1 ESA assessment; review of all title documents; drafting deed and deed restrictions; issue escrow instructions; mapping the parcels....
8. Estimate for purposes of calculating general costs. The actual long term management costs will be determined using a Property Assessment Report (PAR) tailored to the specific acquisition. Includes land management; enforcement and defense of easement or title [short and long term]; monitoring....
9. Each renewable energy project will be a separate sub-account within the REAT account, regardless of the number of required mitigation actions per project.
10. If determined necessary by the REAT agencies if multiple 3rd parties have expressed interest; for transparency and objective selection of 3rd party to carryout acquisition.

Condition of Certification **BIO-12** specifies acquisition of 4,860 acres to mitigate for impacts to Desert Tortoise habitat. Based on the calculations summarized in **Biological Resources - Table 3**, the estimated security with management fees will be \$15,358,970.00. The security amount without management fees would be \$15,007,680.00. The estimated composite mitigation cost for establishing the financial security would be \$3,506.00 per acre (see **Biological Resources - Table 8** for a breakdown of expected costs). This security amount may change when an updated appraisal is made and a PAR is prepared for the parcels that have been selected for acquisition. These are estimates based on current costs and the current REAT compensation table; the requirement is defined in terms of acres, not dollars per acre, and actual costs may vary. If the security proves to be inadequate to secure the necessary acreage because of increases in land costs, the project owner would need to make up the difference. Similarly, if the security was an overestimate the project owner would be refunded the excess. (Ex. 2000, p. 4.2-125.)

The project owner may elect to purchase and permanently protect compensation lands itself, to fund the acquisition and initial improvement of compensation lands through the REAT Account, or to fund the acquisition of compensation lands through a third party as outlined in **BIO-12**. Further, **BIO-12** would require that the project owner provide financial assurances to guarantee an adequate level of funding to implement the compensation measures described above. Because there are several suitable options available to the project owner to satisfy the compensation requirement, and because mitigation requirements must satisfy the requirements of both state and federal Endangered Species acts, the calculation of the security amount includes estimates of all transaction and management fees described above. These calculations are presented in **Biological Resources - Table 8**. We find that the mitigation contained in Condition of Certification **BIO-12** reduces project impacts to Desert Tortoise to below the level of significance. (Ex. 2000, pp. 4.2-125 - 4.2-126.)

### **Indirect and Operational Impacts**

Indirect effects to Desert Tortoises could include soil compaction, fugitive dust, the introduction of non-native and invasive plant species, and increased human presence along access roads. Indirect effects may also include habitat fragmentation, the disruption of existing home ranges, and barriers to dispersal. Increased human presence from new access roads or interest in the facility could lead to increased road kill, illegal collecting, and the spread of disease due to abandonment of captive tortoises infected with upper respiratory tract disease. Operational impacts to Desert Tortoise include both direct and indirect effects including those described above. Typically, these effects are similar in type, but smaller in magnitude, when compared to construction related effects. These effects may include the risk of mortality from vehicle traffic, crushing of burrows by routine maintenance activities on access roads or if any Desert Tortoises remain in the facility area post construction, vegetation management activities, and washing of the heliostats. Other operational effects include fires, habitat

degradation, and the spread of invasive plant species. Increased road traffic on roads in the region either from facility staff or sightseers increases the risk of road kill to both tortoises and common wildlife. This not only results in the loss of Desert Tortoise, but increases the risk for subsidized predators such as ravens and coyotes. (Ex. 2000, p. 4.2-126.)

### **Ravens and Other Predators**

Construction and operation of the PSEGS project has the potential to increase raven and coyote presence in the project area. Ravens depend on human encroachment to expand into areas where they were previously absent or in low abundance. Common ravens were rarely observed within the Project Disturbance Area during surveys in 2009, although one pair was observed nesting in a desert ironwood tree in the north central portion of the Project Disturbance Area. Ravens were present at the site during surveys in 2013 and this species is known from the region. Ravens habituate to human activities and are subsidized by the food and water, as well as roosting and nesting resources that are introduced or augmented by human encroachment. Common raven populations in some areas of the Mojave Desert increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert. Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile Desert Tortoises is considered to be an unnatural occurrence. Multiple coyotes were also observed foraging in the adjacent date farm during surveys of the site in May 2013. In addition to ravens and coyotes, feral dogs have emerged as major predators of the tortoise. Dogs may range several miles into the desert and have been found digging up and killing Desert Tortoises. However, the site is located in a rural area with only sparse residential development. (Ex. 2000, p. 4.2-126.)

Implementation of Condition of Certification **BIO-6**, worker environmental awareness training, **BIO-8** restrictions on pets being brought to the site required of all personnel, and the collection of road kill will reduce or eliminate the potential for these impacts. The project owner would also implement Condition of Certification **BIO-13** (Raven Management Fee) to further reduce impacts to Desert Tortoise from the project's contribution to raven subsidies in the region. To mitigate the PSEGS contribution to cumulative and indirect impacts on Desert Tortoise from raven predation, the project owner would contribute toward implementation of the USFWS Regional Raven Management Program as described in Condition of Certification **BIO-13**. The project owner's payment would support the regional raven management plan activities focused within the Colorado Desert Recovery Unit, which would be adversely affected by increases in raven subsidies attributable to the PSEGS project. (Ex. 2000, p. 4.2-127.)

The PSPP project owner prepared a draft Raven Monitoring and Control Plan to develop methods and BMP to avoid and minimize raven attractants and subsidies for the project site. This draft raven plan is integrated into Condition of Certification **BIO-13**. The project owner's final Common Raven Monitoring, Management and Control Plan

would involve identifying and preventing conditions that might attract or support ravens (for example, eliminating food sources such as garbage or roadkill, minimizing creation of structures that could provide ravens perches, nests or roosts), monitoring the effectiveness of raven management and control measures, and then implementing additional adaptive management measures to make sure that the project does not result in an increase in raven numbers. Implementation of measures in **BIO-13** would avoid or minimize the contributions of the project to increased Desert Tortoise predation from ravens to less-than-significant levels. (Ex. 2000, pp. 4.2-127 - 4.2-128.)

### **Increased Risk from Roads/Traffic**

Vehicle traffic will increase as a result of construction and improvement of access roads, increasing the risk of injuring or killing Desert Tortoise. The potential for increased traffic-related tortoise mortality is greatest along paved roads where vehicle frequency and speed is greatest, though tortoises on dirt roads may also be affected depending on vehicle frequency and speed. Census data indicates that Desert Tortoise numbers decline as vehicle use increases and that tortoise sign increases with increased distance from roads. Additional unauthorized impacts that may occur from casual use of the access roads in the project area include unauthorized trail creation. (Ex. 2000, p. 4.2-128.)

Condition of Certification **BIO-8** contains a variety of minimization measures to minimize the risks of increased traffic fatality and other hazards associated with roads at the project site. These measures include confining vehicular traffic to and from the project site to existing routes of travel, prohibiting cross-country vehicle and equipment use outside designated work areas, and imposing a speed limit of 25 miles per hour on paved and stabilized unpaved roads within the construction site, and 10 miles per hour on unpaved areas within the construction site.

As discussed above, local movement patterns of Desert Tortoise would be disrupted by the project, and tortoises north of the project site attempting to move in a southward direction would be diverted to the east or west, and the perimeter fencing around the project site would direct tortoises towards I-10 on the traffic surface. Tortoise-proof fencing has not been installed along this segment of I-10; therefore, Desert Tortoises moving around the project site would potentially experience increased rates of vehicular-related mortality. The potential increase in Desert Tortoise road fatalities is a significant impact of the project. To reduce this impact to less-than-significant levels, Condition of Certification **BIO-9** (Desert Tortoise Clearance Surveys and Fencing) requires installation of Desert Tortoise exclusion fencing along both sides of I-10 south of the project area, and maintenance of the bridge undercrossings of I-10 as safe and accessible passage for Desert Tortoise. (Ex. 2000, p. 4.2-128.)

The placement of fencing in this area would reduce the potential for tortoise mortality on I-10 and would be considered beneficial to the species. Implementation of standard

BMPs such as those identified in Condition of Certification **BIO-8** would reduce impacts to Desert Tortoise during the installation of the fence. (Ex. 2000, p. 4.2-128.)

### **Impacts from Noxious Weeds**

Many invasive non-native species are adapted to and promoted by soil disturbance. Once introduced, they can out-compete native species because of minimal water requirements, high germination potential, and high seed production. Weeds can out-compete native annuals where nitrogen deposition (near highways such as I-10) and precipitation rates are higher, leading to higher risk of wildfire, and can become locally dominant, representing a serious threat to native desert. Sahara mustard (*Brassica tournefortii*) is regarded as one of the most invasive wild-land pest plants in the Colorado and Mojave deserts, one of the most common invasive plants in Desert Tortoise habitat and capable of dominating entire desert landscapes if no control actions are taken. Sahara mustard spreads explosively during wet years, but even during a 12-year drought in Riverside County (1989-1991), the population of Sahara mustard increased by nearly 35 times. Left uncontrolled, Sahara mustard out-competes and ultimately replaces native wildflowers that provide valuable forage for the Desert Tortoise. Condition of Certification **BIO-14** (Weed Management Plan) includes monitoring and control measures that reduce impacts to Desert Tortoise from increases in Sahara mustard and other weeds to less-than significant-levels. (Ex. 2000, pp. 4.2-128 – 4.2-129.)

### **Other Indirect Impacts**

Indirect effects to Desert Tortoise may occur from wildfires. Desert tortoises that escape direct mortality from wildfires may be affected by fire-induced habitat alteration. Alterations to habitat can result in mortality, decreased fecundity, increased predation, starvation, and dehydration, all resulting in reduced viability of this species. Reduction in plant cover also reduces available shelter as perennial plants, especially woody shrubs, provide protection for Desert Tortoises from mortality due to predators and overheating from the sun. Although single fires may not produce long-term reduction in the cover of perennial plants or biomass of native annual plants, recurrent fire can convert native desert scrub to alien annual grasslands. Indirect effects can also increase the risk of predation by predators attracted to the area by increased human activity, water, or food subsidies. Clearing and grading activities expose large numbers of fossorial species such as small rodents and reptiles to death or injury. Many of these species are killed or injured during these activities and attract ravens and other opportunistic predators. Potential deposition of sediment loads as a result of construction-related sediment mobilization during heavy rain events and flooding downstream would impact existing Desert Tortoise burrows outside of the Project Disturbance Area. (Ex. 2000, p. 4.2-129.)

## **Connectivity**

The PSEGS project is located within designated WHMAs. These include the Palen-Ford WHMA and DWMA Continuity WHMA. Management emphasis for the Palen-Ford WHMA is on the management of the dunes and playas within the Palen-Ford dune system. Management emphasis for the DWMA Continuity WHMA is providing connectivity of tortoises between conservation areas north and south of I-10 (i.e., the Chuckwalla DWMA and Chemehuevi DWMA). The PSEGS project (solar field) is located north of I-10. Adjacent land uses include date farms, a small development, and natural lands including the Palen Dunes. (Ex. 2000, p. 4.2-130.)

The project area may be important for Desert Tortoise movements between higher quality habitats available in the Palen Mountains to the northeast and the Chuckwalla Mountains to the south. The location of the project area connects these higher quality habitats. Similarly, Desert Tortoise are known to use low-quality intermountain habitat, such as that present across most of the project area, as dispersal routes over time, providing connectivity between high-quality habitat areas in the surrounding mountains. Currently, three large culverts under I-10, occurring along the existing washes in the project area, provide Desert Tortoise and other wildlife a safe passage under I-10 in a north-south direction across the project area. The box culverts range in width from 90 to 150 feet and provide an outlet for Corn Springs Wash and other drainages that flow beneath I-10. (Ex. 2000, p. 4.2-130.)

The evidence indicates that habitat fragmentation and isolation of natural areas ultimately results in the loss of native species within those. Populations of animals that are isolated from other populations are at higher risk of extirpation from sources such as drought, disease, or wildlife. In the Colorado Desert, large areas have been subject to habitat fragmentation from development (i.e., Desert Center, Blythe, State Prisons), agricultural practices, and off-highway vehicle use. On a local scale, large solar infrastructure projects have been permitted and several are currently under construction in the Chuckwalla Valley. All of these features fragment habitat and reduce connectivity for some species of wildlife. The amount and distribution of suitable habitat is an essential element to consider for the management of wildlife. For example, some species, such as Desert Tortoise, require, and are often limited to, unique vegetation or terrain features for breeding or foraging. (Ex. 2000, p. 4.2-130.)

Construction of the PSEGS project would produce a barrier to Desert Tortoise in the region. The placement of perimeter fencing will exclude Desert Tortoise from the site and remove approximately 3,948 acres of habitat for this species. Similarly, the facility will eliminate the large washes and other ephemeral drainages within the Project Disturbance Area, which would impair local wildlife movement and reduce habitat connectivity for Desert Tortoise. Although the proposed project would reduce the amount of available tortoise habitat and result in reduced habitat connectivity, habitat

would remain to the west and east of the proposed project to provide connectivity of tortoises in the long term. (Ex. 2000, p. 4.2-131.)

To facilitate Desert Tortoise movement and to connect the undercrossings south of the project with open areas to the west, a large box culvert will be installed under the proposed access road leading to the project site from I-10. This, along with Desert Tortoise fencing along both sides of I-10 to direct Desert Tortoise to nearby undercrossings, would mitigate impacts to connectivity to below a level of significant. These measures are found in Conditions of Certification **BIO-8** and **BIO-9**.

The loss of connectivity for local wildlife movement and for Desert Tortoise is a significant impact for the PSEGS project. Condition of Certification **BIO-12** requires land acquisitions of parcels that contribute to Desert Tortoise habitat connectivity and build linkages between Desert Tortoise populations and designated critical habitat. Implementation of this condition of certification will offset impacts to Desert Tortoise. With implementation of Conditions of Certification **BIO-8**, **BIO-9** and **BIO-12**, project impacts to Desert Tortoise connectivity are reduced to less-than-significant levels. (Ex. 2000, pp. 4.2-131 – 4.2-132.)

### **Cumulative Impacts to Desert Tortoise**

The PSEGS project is located in the Riverside Solar Energy Zone. The Riverside Solar Energy Zone (SEZ) is situated between the Chuckwalla and Pinto Mountains and the SEZ may provide important connectivity for Desert Tortoise movements between the DWMAs. According to the record, approximately 136,800 acres (554 km<sup>2</sup>) of potentially suitable habitat could be directly affected by construction and operations of solar energy development on the revised SEZ. (Ex. 2000, p. 4.2-199.)

Most of the proposed projects in the region appear to impact moderate to low-quality Desert Tortoise habitat. The evidence suggests that the PSEGS project contributions to cumulative habitat loss, even for moderate to low-quality Desert Tortoise habitat, is the same as described for the PSPP and would be cumulatively considerable given the species decline and its present and future threats. The project would also make cumulatively considerable contributions to loss of Desert Tortoise connectivity between the Chuckwalla and Chemehuevi DWMAs and critical habitat areas. One of the objectives for Desert Tortoise recovery in the NECO is to “mitigate effects on Desert Tortoise populations and habitat outside DWMAs to provide connectivity between DWMAs.” Maintaining connectivity is particularly important given the threats posed by global climate change according to the USFWS 2008 Draft Revised Recovery Plan. (Ex. 2000, p. 4.2-199.)

The BLM concluded that overall impacts on the Desert Tortoise from construction, operation, and closure of utility-scale solar energy facilities within the revised Riverside East SEZ is considered moderate, because the amount of potentially suitable habitat for this species in the area of direct effects represents between 1 and 10 percent of

potentially suitable habitat in the region, and the implementation of programmatic design features alone is unlikely to substantially reduce these impacts. (Ex. 2000, p. 4.2-199.)

With implementation of Condition of Certification **BIO-12** (Acquisition of Desert Tortoise Compensation Lands), the project's contribution to the cumulative loss of Desert Tortoise habitat would be reduced to a level less than cumulatively considerable and is consistent with the Commission's Decision for the PSPP. Condition of Certification **BIO-12** specifies that compensation habitat acquisitions occur within the Colorado Desert Recovery Unit in areas that have potential to contribute to Desert Tortoise habitat connectivity and build linkages between desert-tortoise-designated critical habitat, known populations of Desert Tortoise, and/or other preserve land. Many additional measures were devised to minimize indirect effects during operation and accidental impacts during construction, including **BIO-1** through **BIO-11**, Monitoring and Reporting Requirements (**BIO-7**), and Desert Tortoise Compliance Verification (**BIO-11**). The PSEGS project's contribution to the spread of Sahara mustard in Desert Tortoise habitat would be the same as the PSPP project and would be individually minor, but cumulatively considerable. Implementation of Condition of Certification **BIO-14** (Weed Management Plan) will minimize this effect. (Ex. 2000, p. 4.2-200.)

Although project-specific Desert Tortoise mitigation measures reduce the PSEGS project's contribution to cumulative effects to a level less than cumulatively considerable, there are still minor residual effects that could contribute to cumulative effects. These include fragmentation, impaired connectivity, and degradation of the function and values of remaining habitat from predators, non-native invasive plants, fire, and disease. These residual cumulative effects can only be addressed through a regional and coordinated planning effort aimed at preserving and enhancing large, intact expanses of wildlife habitat and linkages, including maintaining connections between wildlife management areas and other movement corridors. Ongoing collaborative efforts by federal and state agencies to develop the Desert Renewable Energy Conservation Plan (DRECP) and the 2012 BLM Solar Energy Development Programmatic EIS offer an appropriate forum for such planning. (Ex. 2000, p. 4.2-200.)

### **Conclusion – Impacts and Mitigation for Desert Tortoise**

Conditions of Certification **BIO-9** through **BIO-11** describe measures that would avoid and minimize direct impacts to Desert Tortoise, and Staff concluded that implementation of these measures would reduce potential direct impacts of PSEGS to less-than-significant levels. To fully mitigate the loss of 3,948 acres of Desert Tortoise habitat and associated fragmentation and loss of connectivity, Condition of Certification **BIO-12** requires acquisition and enhancement of 4,860 acres of Desert Tortoise habitat within the Colorado Desert Recovery Unit in areas that have potential to contribute to Desert Tortoise habitat connectivity and build linkages between Desert Tortoise populations. Evidence indicates that sufficient compensatory mitigation lands are available in the

Colorado Desert Recovery Unit to fulfill this acquisition requirement. (Ex. 2000, p. 4.2-132.)

### **Mojave Fringe-toed Lizard (MFTL)**

The project would directly impact 1,480 acres of MFTL habitat in the northeastern portion of the Project Disturbance Area, an area of active wind-blown sand with relatively shallow sand deposits, as well as areas of deeper and more active vegetated sand dunes. In addition to this direct and immediate loss of habitat, the project would significantly affect downwind MFTL habitat. The northeastern portion of the project as originally configured would interrupt the regional wind-borne sand transport corridor that moves sand southeast and east along the Chuckwalla Valley and toward the Colorado River. (Ex. 2000, p. 4.2-132.)

The MFTL relies on vegetated sand dunes and a regular supply of fine wind-blown sand for its habitat. Active sand dunes (i.e., dunes that have an active layer of mobile sand) exist in a state of dynamic equilibrium, continuously losing sand downwind due to erosion and transport and gaining new supplies from upwind. If the upwind sand supply is cut off, the dunes deflate losing sand downwind and shrinking in size and depth. The finest sand (which is most easily transported) is lost first with coarser sand and gravel being left behind to form an armor or lag. This lag does not support MFTL habitat. (Ex. 2000, p. 4.2-132.)

The PSPP would have affected sand transport because it included a perimeter sand fence that is 30 feet high designed to stop sand from entering the solar array. Most sand transport occurs close to the ground through the processes of rolling and saltation (bouncing of sand particles), with approximately 90 percent of sand transport occurring within six feet of the ground surface. The PSPP Decision concluded that wind fence would pose an effective barrier to sand transport and create a “sand shadow” downwind. A sand shadow is defined as an area downwind of a sand barrier where the wind is able to remove sand but there is no supply of new sand upwind. Over time existing sand dunes in a shadow area would be deflated because they would shrink and become coarser as the fine sand was blown away by the wind. (Ex. 2000, p. 4.2-132.)

The size of the PSEGS project has been reduced to 1,129 acres from the PSPP (1,503 acres for Reconfigured **Alternative 3** and 1,542 acres for Reconfigured **Alternative 3**). The PSEGS would eliminate the large drainage control channels and the majority of the project site would maintain the original grades and natural drainage features. The PSEGS project would also eliminate the PSPP project’s 30-foot-tall wind fences that contribute to disruption of the sand transport. The PSEGS project boundary is defined by a chain-link fence, which would have a very different effect on wind flow and sand transport. Sand may pass through the fence, but winds would be affected by the heliostat array. (Ex. 2000, p. 4.2-133.)

Both Staff's modeled results and the project owner's assessment of the indirect effects of the PSEGS project show that the PSEGS effects would be greater than either of the PSPP's Reconfigured **Alternatives 2** or **3**. (Ex. 2000, p. 4.2-133.)

Other potential indirect and operational impacts of the PSEGS project would include mortality from vehicle strikes, introduction and spread of non-native invasive plants, erosion and sedimentation of disturbed soils, edge effects including fragmentation and degradation of remaining habitat, increased road kill hazard from operations traffic, harm from vegetation management activities including mowing, trimming, and other vegetation removal methods, harm from accidental spraying or drift of dust suppression chemicals, and an increase in access for avian predators (such as loggerhead shrikes) due to new perching structures. Sahara mustard, in particular, is a noxious weed of high concern in the Colorado Desert. Vehicle strikes have been a reported cause of mortality to MFTL on project access roads in the region. At least 118 MFTLs had been killed by vehicle strikes on the Colorado River Substation access road as of January 2013. In addition, at least two Couch's spadefoot toads have been killed on the Colorado River Substation access road. (Ex. 2000, p. 4.2-133.)

Studies cited in evidence found the Coachella Valley fringe-toed lizard to be the only animal species of five vertebrates evaluated to demonstrate a negative response to Sahara mustard abundance. One study indicated that Sahara mustard removal improves habitat quality for fringe-toed lizards. An indirect effect of Sahara mustard on fringe-toed lizards is that it may increase sand compaction within aeolian sand (active dune) communities. Over time, sand compaction could lead to a change in habitat from an aeolian sand community to a stabilized sand community. Condition of Certification **BIO-8** addresses potential impacts from vegetation management. (Ex. 2000, p. 4.2-134.)

The PSPP Decision concluded that impacts to MFTL habitat could be mitigated to less-than-significant levels with implementation of Condition of Certification **BIO-20**. This condition requires acquisition and protection of core populations of MFTL habitat elsewhere in the Chuckwalla Valley. **BIO-20** requires that impacts to stabilized and partially stabilized sand dunes from the project be mitigated at a 3:1 ratio, consistent with recommendations in the NECO plan and with the Commissions' original PSPP Decision. For impacts to non dune habitats (sand fields vegetated with sparse creosote bush scrub) occupied by MFTLs, the mitigation ratio would be 1:1, with the requirement that acquired mitigation lands be within the Chuckwalla or Palen sand transport corridor. Any indirect "sand shadow" impacts would be mitigated at a 0.5:1 ratio. (Ex. 2000, p. 4.2-134.)

The PSEGS project would directly affect 1,480 acres MFTL habitat, a slight reduction from both the Reconfigured **Alternatives 2** and **3** (1,503 acres and 1,542 acres, respectively). Conversely, indirect impacts to downwind habitat and MFTLs would increase in comparison to the PSPP. Off-site impacts could indirectly affect MFTLs

downwind of the project due to projected deflation, stabilization of the dunes, plant successional shifts, and other events that would all degrade MFTL habitat. Off-site indirect impacts to MFTLs would be cumulatively significant, but mitigable. Implementation of existing **BIO-20** still mitigates direct impacts to MFTL habitat to less-than-significant levels. In addition, mitigation measures including maintaining speed limits on site, additional measures including posting additional speed limit signs in MFTL habitat, providing additional worker training related to MFTL, and increasing monitoring and reporting of species and vehicle strikes along project access roads have been incorporated into existing Conditions of Certification **BIO-6** and **BIO-8**. Impacts to MFTL habitat will be mitigated to less-than-significant levels with implementation of Conditions of Certification in **BIO-6** and **BIO-8**. (Ex. 2000, p. 4.2-135.)

Reasonably anticipated cumulative effects considered in evidence include habitat loss, fragmentation and diminished habitat values of remaining lands, and mortality from increased vehicle traffic through lands supporting this species. Other anticipated cumulative effects to MFTLs include impacts to sand transport systems and the maintenance of dunes from renewable energy projects (wind fencing and the obstruction of sand-carrying winds and water-deposited sands), premature stabilization of dunes by the spread of noxious weeds, which also fuel wildfires, increased risk of fire from transmission lines or vehicle use, the effects of past and future grazing and off-road vehicle use, edge effects and fragmentation of the remaining habitat and reduced gene flow, and an increase in predation by ravens and other predators from an increase in perching structures. Obstructions to the wind-sand transport corridor from structures and wind-fencing, and the indirect effects of the obstruction to the maintenance of dunes downwind of the obstruction, would be cumulatively considerable and would result in a cumulatively considerable loss of MFTL habitat. (Ex. 2000, p. 4.2-201.)

Within Chuckwalla Valley MFTL habitat would be directly impacted by the construction of the PSEGS, and the project is a major contributor to that effect. These effects are significant when combined with the expected indirect effects to MFTL habitat including interruption of aeolian (wind-deposited) sand transport processes from projects and their wind fencing, diversions of desert washes and interruption of fluvial transport of sand that contribute to the maintenance of habitat, an increase in avian predators from the new perching structures provided by these projects, and the continuing spread of Sahara mustard. (Ex. 2000, pp. 4.2-201 – 4.2-202.)

The project's contribution to the loss of habitat, increased noise and lighting, road kills, fragmentation, and the spread of invasive pest plants is cumulatively considerable. However, the project's contribution to these effects would be reduced to a level less than cumulatively considerable through implementation of several conditions of certification designed to address indirect effects as well as habitat loss. We find that the loss of MFTL habitat resulting from the PSEGS project would be similar to the PSPP project and would be mitigated to less-than-cumulatively-considerable levels with implementation of Condition of Certification **BIO-20**. The project owner must acquire

and preserve habitat within the Chuckwalla Valley dune system at a ratio of 3:1. Fragmentation from anticipated future development of private lands would be minimized by protecting, in perpetuity, these lands from future development. The project's contribution to the spread of Sahara mustard, which degrades the quality of MFTL habitat, would be the same as the PSPP project and would be individually minor, but cumulatively considerable. We find that this effect would be reduced to a level less than cumulatively considerable through implementation of **BIO-14** (Weed Management Plan). (Ex. 2000, p. 4.2-202.)

The PSEGS project's contribution to significant cumulative effects to MFTLs is not cumulatively considerable after the implementation of conditions of certification intended to minimize or mitigate those impacts below significance, and is consistent with the Commission's Decision for the PSPP. The mitigation includes monitoring by a Designated Biologist (**BIO-1** through **BIO-5**), the Worker Environmental Awareness Program (**BIO-6**), Avoidance & Minimization Measures (**BIO-8**) for construction and operation, acquisition of compensation lands (**BIO-20**), compliance verification (**BIO-11**), the Weed Management Plan (**BIO-14**), and fire prevention measures (**BIO-6**).

### **Couch's Spadefoot Toad**

If Couch's spadefoot toads are present in the Project Disturbance Area, impacts from construction would include loss of habitat and direct mortality during grading and construction. Construction activities that create pits or depressions during the summer rains could provide breeding habitat, which could either be vulnerable to additional construction impacts or be in substrate that is incapable of sustaining ponded water for the necessary time. During project construction and operation Couch's spadefoot toads could be crushed on access roads and it is possible for construction disturbance to cause toads to surface, regardless of whether the season is suitable for emergence. The record indicates that spadefoot toad microhabitat mapping occurred in the summer of 2013 and located no areas of ponding. (Ex. 2000, p. 4.2-135.)

Evidence indicated that the Palen Lake area could be an area of interest for potential marginal Couch's spadefoot toad populations; however, the areas containing suitable breeding habitat were observed on the north and east side of the Palen dunes, which intercept washes coming off the Palen Mountains. Recently this species was discovered east of the project site at the Genesis Solar Energy Project and near the Colorado River substation (an ongoing SCE project). The PSPP Decision concluded for the approved PSPP that no suitable habitat (temporary pools at the base of dunes, in washes, channels, or playas) occurs in the project area and, therefore, the PSEGS project would not result in cumulatively considerable impacts to this species consistent with the Commission's PSPP Decision. While it is possible that this species may occur along portions of the natural-gas pipeline, surveys performed in spring 2013 did not detect this species. Although not required for Couch's spadefoot toad, the implementation of Condition of Certification **BIO-12** for Desert Tortoise (which preserves 4,860 acres of

Desert Tortoise habitat) may also preserve some habitat for Couch's spadefoot toad as well. (Ex. 2000, p. 4.2-207.)

## **SPECIAL-STATUS AVIAN SPECIES**

### **Bald and Golden Eagle**

Golden eagles can be extremely susceptible to disturbance during the breeding season and adverse effects are possible from various human activities up to (and in some cases exceeding) one mile from a nest site. Disturbance is any activity that would result in injury to an eagle or which would substantially interfere with normal breeding, feeding, or sheltering behavior. For example, a nestling being knocked from the nest by a startled adult would be considered an injury. A nestling fed inadequately because adults were agitated in the vicinity of the nest due to construction-related noise and activity would also be considered substantial interference, as would a situation in which nestlings starve because the adults were excluded from their familiar foraging grounds and could not provide adequate food to their young. Surveys documented two active nests approximately seven miles southwest of the PSEGS project site in the Chuckwalla Mountains, three inactive nests approximately six miles southwest of the site in the Chuckwalla Mountains, one inactive Golden Eagle nest just over 10 miles southeast of the site in the Chuckwalla Mountains, and two active Golden Eagle nests just over 10 miles northeast of the site in the Palen Mountains. Preliminary results of spring 2013 helicopter surveys have indicated detection of three active nests in the Chuckwalla Mountains. (Ex. 2000, pp. 4.2-139 – 4.2-140.)

The evidence shows that project construction activities could potentially injure or disturb Golden Eagles if nests were established sufficiently close to project boundaries to be affected by the sights and sounds of construction. However, the evidence indicates that these potential impacts are unlikely because suitable nesting substrate (i.e., cliff ledges, rocky outcrops, or large trees) does not occur within one mile of the PSEGS project area. The only potential nesting substrate within one mile of project boundaries would be transmission line towers. If such nesting occurs on transmission lines, disturbance to Golden Eagle nests would be avoided with implementation of Condition of Certification **BIO-16**. This condition recommends that during construction, Golden Eagle nest surveys be conducted in accordance with USFWS guidelines to verify the status of Golden Eagle nesting territories within one mile of the project boundaries. Implementation of **BIO-16** will reduce potential impacts of project construction on nesting Golden Eagles to less-than-significant levels. (Ex. 2000, p. 4.2-140.)

The habitat loss from the PSEGS project would be similar to the approved PSPP and would contribute to the cumulatively considerable loss of Golden Eagle foraging habitats in the Chuckwalla Valley and the NECO planning area, as well as the loss of habitat utilized by Bald Eagles primarily during migration. The project's contribution to the cumulative impacts is more significant when combined with the reasonably foreseeable indirect effects of habitat fragmentation from the construction of proposed future

projects. The USFWS and others estimate there are approximately 30,000 Golden Eagles in the western U.S., down from an estimated 100,000 in the late 1970s. Survey data indicates a decline of 26 percent since 2003. Climate change is also expected to impact Golden Eagles by increasing drought severity, and the CO<sub>2</sub> concentrations are expected to exacerbate the spread of non-native invasive plants, which displace native species and habitats, fuel wild fires, and alter fire regimes. Additionally, the transmission lines for this and other proposed future projects are also expected to increase raptor collisions and electrocutions. The use of power tower technology may further contribute to the decline of Golden Eagles from exposure to elevated levels of solar flux. (Ex. 2000, p. 4.2-202.)

Proposed future projects within the NECO planning area and Chuckwalla Valley would cumulatively displace substantial amounts of foraging habitat for Golden Eagles including creosote bush scrub and desert dry wash woodland. Habitat loss for Bald Eagles would also occur, but the species is expected to occur as a migrant. The PSEGS project's contribution to the cumulative loss of foraging habitat within the NECO planning area would be minimized to a level less than cumulatively considerable through mitigation measures for acquisition of 4,860 acres of Sonoran creosote bush scrub habitat, as specified in Condition of Certification **BIO-12**. Further, 788 acres of desert washes and riparian habitat within or adjacent to the Chuckwalla-Ford Dry Lake watershed would be placed under permanent protection under Condition of Certification **BIO-22**. While acquisition does not address the net loss of foraging habitat in the immediate future, it is expected to prevent future losses of habitat by placing a permanent conservation easement and deed restrictions on private lands that could otherwise be converted for urban or agricultural uses or energy development. (Ex. 2000, pp. 4.2-202 – 4.2-203.)

The PSEGS project's contribution to the spread of invasive non-native plants such as Sahara mustard, which degrades the habitat and fuels fires, would be less than cumulatively considerable after implementation of Condition of Certification **BIO-14** (Weed Management Plan). (Ex. 2000, p. 4.2-203.)

The project's associated transmission lines contribute to a cumulatively-considerable effect from collisions and electrocutions for Golden Eagles and other raptors. This impact would be less than cumulatively considerable with implementation of Condition of Certification **BIO-8** that requires that transmission lines and all electrical components be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) Suggested Practices for Avian Protection on Power Lines and Mitigating Bird Collisions with Power Lines. Implementation of Conditions of Certification **BIO-16a** and **BIO-16b** further minimize the project's contribution to cumulatively considerable impacts from collisions, electrocutions, and habitat loss and degradation through the development of monitoring and an adaptive management program, power line retrofits, and annual funding for the life of the project for avian

conservation actions, including habitat enhancement and restoration, to avoid, minimize, and mitigate future project-related avian impacts. (Ex. 2000, p. 4.2-203.)

The project's contribution to cumulative effects to Golden Eagles from the operation of the PSEGS project would be cumulatively considerable even with the implementation of conditions of certification. This conclusion differs from the PSPP and is based on the risk from exposure to elevated levels of solar flux. While it is uncertain, project operation has the potential to result in injury or mortality (take) to Golden Eagles and, to a very limited extent, to Bald Eagles from exposure to elevated levels of solar flux and or irradiance during the life of the project. The record indicates that there are no scientific peer reviewed models that allow us to accurately quantify the expected number that would be subject to mortality or morbidity during the operation of the project. However, Staff considers the risk to be real based on the presence and use of the area by Golden Eagles, and periodically by Bald Eagles, the physical and behavioral characteristics of the eagles (i.e., large size, soaring flight patterns, elevation of flight), and the presence of elevated levels of solar flux. Conditions of Certification **BIO-16a** and **BIO-16b** provide meaningful mitigation that will minimize the project's contribution to cumulatively considerable impacts through habitat enhancement and other actions. However, the impacts would remain cumulatively considerable even with the implementation of mitigation. (Ex. 2000, p. 4.2-203.).

Thus, the PSEGS project will contribute a small but cumulatively considerable amount to the loss of foraging habitat for this species and is consistent with the Commission's Decision for the PSPP. The risk to Golden Eagles from exposure to solar flux presents an ongoing threat of mortality or morbidity during the lifetime of the project. Anticipated indirect effects may remain cumulatively considerable even with the application of proposed mitigation. These include collisions and electrocutions, mortality or morbidity from exposure to elevated levels of solar flux, fragmentation of remaining habitat, spread of Sahara mustard, and increased risk of fire. The mitigation required for Golden and Bald Eagles includes compensation lands for loss of Sonoran creosote bush scrub (**BIO-12**), Golden Eagle inventory and monitoring (**BIO-25**), avoidance measures (**BIO-8**), monitoring for off-site nesting, collisions, and adaptive management (**BIO-16 b**), funding for power line retrofits and habitat enhancement, and restoration actions throughout the life of the project (**BIO-16a**). (Ex. 2000, p. 4.2-215.)

### **Western Burrowing Owl**

Burrowing owl and their sign (feathers, whitewash, and/or pellets) were detected on the project site during protocol surveys conducted for the approved PSPP project. No Burrowing owls or active owl burrows were documented within the ¾-mile and 1-mile buffer transects performed during spring 2009 surveys for this species. Surveys conducted for the natural-gas pipeline alignment in 2013 detected one Burrowing owl; however, an active burrow was not detected in the proposed disturbance area. As of 2010, at least five potentially active owl burrows occurred within the Project Disturbance

Area. At that time, at least four owls (two adults and two juvenile/fledglings) were present on the project site. It is possible that the number of breeding owls on the project site has changed since the PSPP was approved. During avian point count and raptor surveys conducted in 2013, the project owner documented 18 Burrowing owl observations across the project site. (Ex. 2000, p. 4.2-135.)

Direct impacts to Burrowing Owls include: the loss of nest sites, eggs, and/or young; permanent loss of breeding and foraging habitat; and disturbance of nesting and foraging activities for Burrowing Owl pairs within the project site, buffer, or immediately surrounding area. This includes crushing burrows, increased noise levels from heavy equipment, disturbance from human presence, and exposure to fugitive dust. Because Burrowing Owls are cavity dwellers that are primarily active during crepuscular periods (i.e., dawn and dusk) or at night, birds flushed from burrows during the day would be exposed to elevated predation risk from raptors. Burrowing Owls also exhibit site fidelity and owls displaced from a burrow during construction or from passive relocation activities have an increased risk of mortality from predation if they lack access to adequate burrows. (Ex. 2000, p. 4.2-136.)

Indirect impacts to Burrowing Owls during construction and from operation of the facility can include increased road kill hazards, modifications to foraging and breeding activities, and loss of prey items and food sources due to a decreased number of fossorial mammals. Indirect and operational impacts to nesting birds may also include the loss of habitat due to the colonization of invasive plants and the disruption of breeding or foraging activity due to facility maintenance. Weed abatement, mirror washing, and maintenance activities would likely limit the use of some areas as foraging or nesting habitat. Burrowing Owls may also be at risk from collision or electrocution with facility structures and from exposure to elevated levels of solar flux (see Impacts to Migratory/Special-status Bird Species below). (Ex. 2000, p. 4.2-136.)

Implementation of the PSEGS project will destroy occupied burrows or cause owls to abandon burrows. Construction during the breeding season could cause the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The loss of occupied Burrowing Owl habitat (habitat known to have been occupied by owls during the nesting season within the past three years) or reductions in the number of this rare species, either directly or indirectly through nest abandonment or reproductive suppression, would constitute a significant impact absent mitigation. Furthermore, Burrowing Owls and their nests are protected under both federal and state laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code section 3503.5. (Ex. 2000, p. 4.2-136.)

The evidence indicates that there is much debate among state, federal, local, and private entities over the most practicable and successful relocation/translocation methods for Burrowing Owls. When passive relocation is used solely as an impact avoidance measure, it is generally only effective when Burrowing Owl nesting territories

are directly adjacent to permanently protected lands (i.e. military reservations, airports wildlife reserves, and agricultural reserves with appropriate crop types such as alfalfa). Passive relocation has been criticized as a relocation method because relocated or displaced owls are tenacious about returning to their familiar burrows and are inclined to move back to the impact site if the impact site is still visible to the owl, and/or if the impact site is not completely graded. Because project construction will be phased and occurring over multiple years, passive relocation may result in the repeated harassment of resident owls should they try to re-establish territories within the projects footprint. While construction of replacement burrows in off-site areas and the acquisition of mitigation lands would reduce impacts to the species, it is likely that owls would attempt to occupy areas close to known territories. This would require multiple passive relocation events for the same owls. Each of these events stresses the bird and exposes the owls to predation, lost breeding opportunities, thermal stress, and potential territorial disputes. Burrowing owls are put at increased risk when they are introduced to a new environment. The owls are naturally preyed upon by numerous diurnal and nocturnal avian and mammalian species and evicting owls from their familiar burrow, territory, and home range without a safe opportunity to become familiar with their new habitat increases the potential for predation. Thus, many Burrowing Owls likely die during passive relocations used for permanent owl eviction. (Ex. 2000, pp. 4.2-136 – 4.2-137.)

For successful active or passive relocation, breaking the owl's site fidelity is of utmost importance. The off-site location for the relocated owls should ideally have an existing Burrowing Owl colony and a large ground squirrel colony. Should neither colony already exist at the translocation site, artificial burrows should be installed if significant grassland or appropriate agricultural crop type is present. Active translocation of owls involves trapping owls, temporarily holding them in enclosures with supplemental feeding, and releasing them at a suitable off-site location with existing or artificial burrows prior to breeding. (Ex. 2000, p. 4.2-137.)

While active translocation might be a better solution than passive relocation for moving owls from large sites like the project site, California Fish and Game Code 3503.3 prohibits the active relocation of Burrowing Owls unless the effort is designed as a research project. Therefore, we would only impose the implementation of passive relocation techniques. Although passive relocation would be conducted to avoid direct mortality of owls within the proposed project area, previously occupied burrow(s) will be destroyed and foraging habitat would be degraded. Due to the loss of habitat, compensatory mitigation is required to reduce these impacts to less-than-significant levels. The location and amount of compensatory habitat required to mitigate impacts to Burrowing Owls is often based on the number of impacted owls and assumes that currently occupied habitat would be replaced with nearby occupied habitat. (Ex. 2000, p. 4.2-137.)

Compensatory mitigation for Burrowing Owls identified for the approved PSPP project was based on guidelines recommended in the CDFG Staff Report on Burrowing Owl Mitigation and by the California Burrowing Owl Consortium. The USFWS noted that the above guidelines were developed for owls nesting in coastal habitats, and their efficacy in desert environments has not been ascertained. No documentation is available to statistically evaluate the success of passive relocation in Southern California. Passive relocations in western Riverside County have not involved banded birds, so information on rates of success and direct/indirect mortality are not available. Reports elsewhere do not provide long term analyses associated with passive relocation efforts to determine if passively relocated Burrowing Owls are present in the area after one or more years. The lack of documented success of passive translocations raises concerns regarding the fate of evicted owls. (Ex. 2000, pp. 4.2-137 – 4.2-138.)

In 2012 the CDFW (formerly CDFG) published The Staff Report on Burrowing Owl Mitigation. This document indicated that “reversing declining population and range trends for Burrowing Owls will require implementation of more effective conservation actions, and evaluating the efficacy of the Departments’ existing recommended avoidance, minimization and mitigation approaches for Burrowing Owls.” The new guidelines provide revised methods for surveying, reflect new data on the species, and recommend an ecological approach to establishing mitigation for this species. The 2012 guidance departs from the standardized approach to determining off-site habitat compensation because the acreages are often implemented as the “default” mitigation and may not reflect the actual habitat requirements of the species in a given location. (Ex. 2000, p. 4.2-138.)

Acquisition of the appropriate amount of off-site habitat for Burrowing Owls should take into consideration the foraging distance and average home range of breeding and non breeding owls. Diurnal home range for owls can be 150 feet on both sides of a burrow. Nocturnal home range is much larger, one square mile per owl pair, and several owls can overlap in that one square mile. Male Burrowing Owls often move greater than 1,000 meters when foraging in the breeding season and home ranges can oftentimes overlap. (Ex. 2000, p. 4.2-138.)

The PSPP Decision required a minimum of 78 acres (19.5 acres each) of suitable, off-site (preferably occupied) Burrowing Owl habitat be acquired to offset the loss of foraging and nesting habitat for owls that occur in the Project Disturbance Area. This mitigation was based on the 1993 Burrowing Owl Guidelines, which the new guidelines suggest may not adequately compensate for Burrowing Owls in arid ecosystems. The compensatory mitigation approach would likely be different based on the 2012 guidelines and acknowledges that the mitigation acreages alone would not likely be effective in reducing impacts to the species from the loss of over 3,948 acres of foraging habitat. However, the compensatory mitigation requirements for land acquisition will be “nested” within Desert Tortoise mitigation (see Condition of Certification **BIO-12**). Under this condition the project owner must acquire approximately 4,860 acres of Desert

Tortoise habitat. Provided the lands meet the requirements for Burrowing Owls, we consider this approach a viable mitigation option. The land acquisition identified under **BIO-12** would far exceed the recommendations for off-site compensatory Burrowing Owl mitigation identified in the 2012 guidelines and would theoretically support multiple pairs of owls. (Ex. 2000, pp. 4.2-138 – 4.2-139.)

To avoid potential impacts to Burrowing Owls in the Project Disturbance Area, we will require that PSEGS conditions of certification (described below) include the completion of pre-construction surveys of the site using established protocols. If Burrowing Owls are present, the project owner would establish a buffer and avoid active nests during the breeding season. If owls are detected using a burrow outside the breeding season, the owls may be passively displaced pending the establishment of artificial burrows and the acquisition of adequate mitigation lands. (Ex. 2000, p. 4.2-139.)

Condition of Certification **BIO-18** (Burrowing Owl Impact Avoidance, Minimization and Compensation Measures) requires the project owner to prepare and implement a Burrowing Owl Mitigation Plan that would include the following elements: a description of suitable Burrowing Owl relocation/translocation sites; guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl if an existing Burrowing Owl and/or ground squirrel colony does not occur outside the Project Disturbance Area; detailed methods and guidance for passive relocation of Burrowing Owls; and a description of proposed maintenance monitoring, reporting, and management of the relocated Burrowing Owls. This condition also requires acquisition and enhancement of a minimum of 78 acres of off-site suitable nesting and foraging Burrowing Owl habitat as mitigation for displacement of at least four owls. With implementation of Conditions of Certification **BIO-18** and **BIO-12**, direct impacts to Burrowing Owls would be reduced to less-than-significant levels. Indirect impacts to Burrowing Owls would include collisions with project features, glare, collision, electrocution, and exposure to elevated levels of solar flux. Conditions of Certification **BIO-16a** and **BIO-16b** provide for ongoing project monitoring and implementation of a suite of habitat restoration and enhancement measures that would benefit Burrowing Owls and implement adaptive management strategies based on results of project monitoring. However potential indirect impacts may remain significant after mitigation. (Ex. 2000, p. 4.2-139.)

The project's contribution to the cumulative loss of Burrowing Owl habitat is consistent with the Commission's Decision for the PSPP. The loss of habitat from all proposed future projects is significant, and the project's contribution to that effect is cumulatively considerable. The project would also contribute to a cumulatively considerable impact from habitat fragmentation and edge effects, noise, lighting, increased road kills, increased risk of fire from weed invasion and increased ignition sources (vehicles), and an increase in avian predators, all of which ultimately degrade the function and values of the remaining habitat. Burrowing owls may also be at risk from operation of the facility from collisions or exposure to elevated levels of solar flux. (Ex. 2000, p. 4.2-204.)

The PSEGS project's contribution to these indirect effects and loss of habitat would be mitigated to a level less than cumulatively considerable through **BIO-18** (Avoidance and Minimization Measures Specific to Burrowing Owl), measures for addressing impacts from noise, lighting, and traffic (road kills) through a variety of measures in **BIO-8**, **BIO-14** (Weed Management Plan) and **BIO-27** (Revegetation of Temporarily Disturbed Soils) to address the project's contribution to the spread of Sahara mustard and other weeds, **BIO-12** for acquisition of 4,860 acres of Desert Tortoise habitat, which is expected to contain suitable habitat for Burrowing Owl, and **BIO-21**, which requires acquisition and protection of desert washes and adjacent habitat within the local watersheds that would minimize future fragmentation in the Chuckwalla Valley area by protecting lands from future development. The Raven Management Plan (**BIO-13**) is expected to minimize the project's contribution to the increase of avian predators of Burrowing Owls. (Ex. 2000, p. 4.2-205.)

The Energy Commission determined that cumulative effects to Burrowing Owls from construction of the PSPP would be mitigated to less-than-significant levels; however, the risk to Burrowing Owls from exposure to elevated levels of solar flux from the PSEGS may be cumulatively considerable even with the implementation of Conditions of Certification **BIO-16a** and **BIO-16b**. Burrowing Owls have been routinely observed on the site, are known to occur in the region, and have flight characteristics that place them at operational risk during the life of the project. (Ex. 2000, p. 4.2-205.)

The PSEGS project's contribution to significant cumulative effects from habitat loss to Burrowing Owls is not cumulatively considerable after the implementation of conditions of certification intended to minimize or fully mitigate those impacts. These effects are consistent with the Commission's Decision for the PSPP. However, indirect impacts to Burrowing Owls may remain cumulatively considerable even with the application of proposed mitigation. These impacts include collisions and electrocutions, mortality or morbidity from exposure to elevated levels of solar flux, fragmentation of remaining habitat, spread of Sahara mustard, and increased risk of fire. The mitigation specific to Burrowing Owls includes Burrowing Owl-specific avoidance & minimization measures (**BIO-18**), general avoidance and minimization measures for noise, lighting, and road kills, etc. (**BIO-8**), raven management (**BIO-13**), Weed Management Plan (**BIO-14**), fire prevention measures in **BIO-6**, monitoring during project operation and adaptive management (**BIO-16 b**), and funding for habitat enhancement and restoration actions throughout the life of the project (**BIO-16a**). (Ex. 2000, pp. 4.2-215 – 4.2-216.)

## **Special-status Avian Species**

Birds are the most conspicuous vertebrate found in the California Deserts. Records exist for at least 425 species from 18 orders and 55 families. These approximately 350 species are characterized as Neotropical migrants who pass through the region during spring and fall migrations. These birds include various raptors including Swainson's Hawks, Turkey Vultures, and numerous passerines, some of which include least Bell's Vireo, Southwestern Willow Flycatchers, many hummingbirds, and various warblers. Shorebirds and other waterfowl are common migrants that have the potential to occur in the project area. (Ex. 2000, p. 4.2-140.)

The project site and Chuckwalla Valley provide foraging, cover, and/or breeding habitat for a wide variety of resident and migratory birds. Localized water sources such as Lake Tamarisk are known to attract birds as are irrigated agricultural areas including the palm groves that abut the PSEGS project site. Ponds, including the small cement lined reservoir located at the northwest corner of the site are also expected to attract a variety of birds. Both the project site and adjacent habitat support microphyll woodlands that have been recognized as important habitat for resident and migratory birds. (Ex. 2000, p. 4.2-141.)

How a given species is affected by project construction or operation is a function of the species ecology and behavior. Although the project area does not provide breeding habitat for many species (i.e., Swainson's Hawks, Northern Harriers, Peregrine Falcons, or Yellow Warblers), these species are known from the region and have been documented over-flying the site during migration or in the winter. These species may forage or rest on the project site. Similarly, many species of raptors winter in desert regions and become seasonal long term winter residents. Resident species are also affected by how they use the site. Some species of birds may be semi-permanent dwellers while nesting, exhibiting strong site fidelity and territorial behavior; however, these species may have much broader ranges during the winter. (Ex. 2000, p. 4.2-141.)

Direct impacts to nesting and migratory birds would include the loss of foraging and nesting habitat and disturbance from construction activities. Construction during the breeding season could also result in displacement of breeding birds and abandonment of active nests. Small, well-hidden nests could be subject to loss during construction. Similarly, increased noise levels from heavy equipment, human presence, and exposure to fugitive dust could displace native birds or interfere with breeding. Habitat fragmentation, degradation and shifts in vegetative structure can affect nesting birds. In addition, noise and lighting effects have been demonstrated to adversely affect behavior, reproduction, and increase the risk of predation for some species. (Ex. 2000, p. 4.2-141.)

Indirect impacts to nesting birds could include the loss of habitat due to the colonization of invasive plants and a disruption of breeding or foraging activity due to facility

maintenance. Weed abatement, mirror washing, and maintenance activities would disrupt use of the area as foraging or nesting habitat. (Ex. 2000, p. 4.2-141.)

During project construction, birds may nest on construction equipment, office trailers, and vehicles. Birds may also become trapped in any narrow vertical pipes left uncovered. Birds have been documented to descend into pipes either in search of nest cavities or food and become trapped in the pipes. Once inside the cavity, the birds cannot climb the slick interior or spread their wings to fly. (Ex. 2000, p. 4.2-141.)

Implementation of the PSEGS project will result in the direct loss of habitat that supports breeding and foraging for a variety of resident and migratory birds. This includes the functional loss of approximately 3,948 acres of habitat including Sonoran creosote bush scrub, desert dry wash woodland, dunes, and ephemeral drainages. Although nesting habitat for most migratory birds would not be lost, the removal of foraging habitat, cover, and roost sites for these species would be substantial. The project would have more substantial impacts to resident breeding birds, some of which include Loggerhead Shrike, California Horned Lark, and Le Conte's Thrasher. The PSEGS project owner has proposed to mow vegetation and allow some plants to persist within the heliostat field. However, remaining habitat will be degraded and nesting birds would be subject to ongoing maintenance activities. Le Conte's Thrasher, Loggerhead Shrike and other wash-dependent species will in particular be affected by the loss of the cover, foraging and nesting opportunities provided by the structurally diverse and relatively lush desert dry wash woodland. Dry washes contain less than 5 percent of the Sonoran Desert's area, but are estimated to support 90 percent of Sonoran Desert birdlife. The loss of habitat from the project would be significant absent mitigation. (Ex. 2000, p. 4.2-142.)

Condition of Certification **BIO-12**, the Desert Tortoise Compensatory Mitigation Plan, **BIO-16a**, which would annually fund habitat enhancement and restoration, and **BIO-21**, Mitigation for Impacts to State Waters, would offset the project's contribution to cumulative loss of habitat for avian species. (Ex. 2000, p. 4.2-142.)

Implementation of the PSEGS project will cause direct, indirect and operational effects to nesting birds. During construction, most birds would likely disperse to adjacent habitat during initial vegetation clearance. However, if site grading, brush removal, or construction occurs during the nesting season, bird nests may be destroyed, including eggs or nestling birds. Ground nesting species such as Night Hawks, Poorwills, Roadrunners, Horned Lark, and various shrub nesters may be disproportionately affected. (Ex. 2000, p. 4.2-142.)

Noise during construction may adversely affect bird nesting success. For most common species, the evidence suggests that this impact would be less than significant, but it could significantly affect breeding habitat suitability for native birds, including special-status species. The loss of active bird nests or young is regulated by the federal Migratory Bird Treaty Act and Fish and Game Code section 3503, which protects active nests or eggs of California birds. Mitigation measures to avoid and minimize impacts to

nesting are contained in Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures), **BIO-15** (Pre-construction Nest Surveys), which describes guidelines for performing pre-construction surveys, **BIO-16a** (Avian Enhancement and Conservation Plan), which would implement funding toward habitat restoration and enhancement, and **BIO-16b** (Avian and Bat Protection Plan), which provides a mechanism to monitor for bird collisions and implement adaptive management measures to minimize impacts. Implementation of conditions of certification will avoid direct impacts to nests, eggs, or young of migratory birds, and minimize the impacts to less-than-significant levels for construction disturbance to resident and migratory birds. Potential special status and migratory bird impacts attributable to operation of the project are discussed below for all avian species, in the subsection entitled “Operational Impacts to Flighted Species.” (Ex. 2000, p. 4.2-142.)

### **Operational Impacts to Flying Species**

The PSEGS project will introduce several factors that could result in mortality, morbidity, and reduced reproductive success in birds, bats, and insects. Potential impacts of the operating facility to birds, bats, and insects include physical injury resulting from collision with power towers, heliostats, or other project infrastructure features, electrocution, and disorientation (disturbance from lighting, mirror reflection, etc.). Ocular damage, hyperthermia and, depending on period of exposure and level of flux, burning and other heat-caused damage to internal and external body parts, as well as residual damage (morbidity) may occur to bats, birds, or insects that enter the airspace over the heliostat field where elevated solar flux exists. (Ex. 2000, p. 4.2-150.)

There are many factors that contribute to the potential risk of operational impacts (i.e., electrocution, collision, glare, or exposure to solar flux) to birds. In addition to weather, risk is a function of the birds ecological, physiological, and behavior characteristics. Some of these factors include when a bird is active (i.e., diurnal or nocturnal), the elevation at which a bird flies or migrates, flight and foraging behavior, the size or mass of the bird, bird color, localized residency pattern, and the period a bird is present in the region are other factors that effect risk. Each of these factors is considered below when assessing risk to a given species of bird from the operation of the PSEGS project. (Ex. 2000, p. 4.2-150.)

Collision risk at night would be expected to increase for nocturnal species including migrants. Nocturnal migrants, which include many species of passerines, would be expected to have a higher collision risk and a lower risk from exposure to elevated levels of solar flux. Conversely, birds that are more active during periods of daylight may have an increased risk of flying into areas containing elevated levels of solar flux. For example, many raptors and soaring birds rely on ascending thermal air columns to aid in flight; aerial foragers including swifts and swallows feed on flying insects and these species would be expected to have a higher risk from exposure to elevated levels of solar flux or glare. (Ex. 2000, p. 4.2-150.)

However, in any natural system activity, patterns may vary and species may be active during both diurnal and nocturnal periods. Low flying birds or ground foragers including roadrunners are likely have a reduced risk from exposure to solar flux. (Ex. 2000, p. 4.2-150.)

### **Electrocution**

Large raptors such as golden Eagles, Red-Tailed Hawks, and Great-Horned Owls can be electrocuted by transmission lines when a bird's wings simultaneously contact two conductors of different phases, or a conductor and a ground. This happens most frequently when a bird attempts to perch or take off from a structure with insufficient clearance between these elements. Electrocution can occur when horizontal separation is less than the wrist-to-wrist (flesh-to-flesh) distance of a bird's wingspan or where vertical separation is less than a bird's length from head-to-foot. Electrocution can also occur when birds perched side by side span the distance between these elements. (Ex. 2000, p. 4.2-150.)

In addition, distribution lines that are less than 60 kV but greater than 1 kV pose an electrocution hazard for raptor species attempting to perch on the structure. The majority of bird electrocutions are caused by lines that are energized at voltage levels between 1-kV and 60-kV, and "the likelihood of electrocutions occurring at voltages greater than 60-kV is low," because phase-to-phase and phase-to-ground clearances for lines greater than 60-kV are typically sufficient to prevent bird electrocution. (Ex. 2000, p. 4.2-151.)

The PSEGS transmission lines will be 230 kV and fitted on top of monopole structures that are approximately 120 feet in height with an average length of 1,100 feet between poles. The transmission line and pole fitting will be constructed in accordance with the guidelines of Institute of Electrical and Electronics Engineers (IEEE) Guide 524 "Guide to the Installation of Overhead Transmission Line Conductors" and would also follow the Suggested Practices for Avian Protection on Power Lines. Also, the lines will be insulated from the poles using porcelain insulators engineered for safe and reliable operation at a maximum operating voltage of 242-kV. (Ex. 2000, p. 4.2-151.)

To minimize risk of electrocution, the project must implement a "raptor-friendly" construction design for the transmission line with conductor wire spacing greater than the wingspans of large birds to help prevent electrocution as described in "Suggested Practices for Avian Protection on Power Lines." Condition of Certification **BIO-8** requires above-ground transmission lines and all electrical components to be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee Guidelines (APLIC) to reduce the likelihood of large bird electrocutions and collisions. With the Implementation of Condition of Certification **BIO-8**, the project transmission lines will not pose a significant electrocution threat to birds. Additionally, the project owner has proposed to conduct power line retrofits, which has been incorporated into Condition of Certification **BIO-16a**. (Ex. 2000, p. 4.2-151.)

## **Collisions, Lighting, and Glare**

The PSEGS project will include two power towers, heliostat fields, and ancillary equipment including boilers and control facilities. On-site facilities range from a height of 750 feet (power towers) to 120 feet for boilers and the air-cooled condenser unit. Each of the heliostats is approximately 12 feet high. The remaining facilities are generally less than 80 feet in height. All of these features would pose a potential collision risk for birds. Birds are known to collide with communications towers, transmission lines, and other elevated structures including buildings. Estimates of the number of bird fatalities specifically attributable to interactions with utility structures vary considerably. Nationwide, it is estimated that hundreds of thousands to as many as 175 million birds are lost annually to fatal collisions with transmission and distribution lines. Numerous studies have also documented extensive avian collision mortality associated with buildings and similar structures such as smokestacks or monuments. In California, even general estimates are unavailable, although it is plausible that such collisions result in the deaths of hundreds of thousands of birds each year. (Ex. 2000, p. 4.2-151.)

Collisions typically result when the structures are invisible (e.g., bare) power lines or guy wires at night, deceptive (e.g., glazing and reflective) glare, or confusing (e.g., light) refraction or reflection from mist. Collision rates generally increase in low-light conditions, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. APLIC has determined that collisions are more probable near wetlands, within valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Passerines (e.g., songbirds) and waterfowl (e.g., ducks) are known to collide with wires, particularly during nocturnal migrations or poor weather conditions. (Ex. 2000, p. 4.2-152.)

Diurnal birds, or those active during daylight hours, could also collide with tall structures. Staff has concluded that the risk of such impacts is low. Most diurnal bird collisions with tall structures are associated with guyed towers in poor visibility conditions such as fog or inclement weather. The PSEGS does not include guyed structures. (Ex. 2000, p. 4.2-152.)

The PSEGS project will have two evaporation ponds (approximately two acres each) that could attract birds to the site. Existing date palm and jojoba farms and other agricultural practices in the area may also attract birds, subjecting them to greater risk of collisions. (Ex. 2000, p. 4.2-152.)

To date, little is known regarding the avian response to glare from solar technology. However, it is likely that glare will affect birds to some degree. In the same way that large mirrored buildings may be confused by birds as open sky, the mirrors will reflect light and take on the color of the image being reflected, and also polarize light as discussed further below. This may result in birds confusing the heliostats as either open sky or water and increase the collision risk. Staff has reviewed research by McCrary et al. (Ex. 3026), which quantified bird mortality including collisions at a 10 MW pilot SRSG

(power tower) pilot facility (Solar One) near Daggett, California. The Solar One facility consisted of a 79-acre heliostat field and a 282-foot solar receiver tower. McCrary et al. documented 70 bird fatalities during the course of a 40-week study, and the total average mortality rate was 1.9 to 2.3 birds per week. Staff is not aware of any other scientific study of bird mortality at any other comparable generator. McCrary et al. partially attributed these collisions to high numbers of birds attracted to the adjacent evaporation ponds and agricultural fields. Anecdotal reports of collisions are becoming more common as large-scale photovoltaic (PV) and concentrating solar power facilities are developed in the desert. Similar to heliostat mirrors, photovoltaic panels can reflect light and may be confused by birds as water or sky. Although PV panels absorb solar radiation and are typically less reflective than heliostat panels, they may still pose a collision risk to birds or bats. At both the Desert Sunlight Solar Farm Project site and the Genesis Solar Electric Project, birds and bats have been found injured or dead on the site, some of which appeared to be suffering from heat exhaustion. Of these, the majority consisted of water birds, species that would be expected as migrants not typically found foraging in desert habitat and whose presence would not have been expected to occur at the project site. A federally endangered species, the Yuma Clapper Rail, was among the recorded mortalities. (Ex. 2000, p. 4.2-152.)

Lighting also plays a substantial role in collision risk because lights can attract nocturnal migrant songbirds, and major bird kill events have been reported at lighted communications towers with most kills resulting from towers higher than 300 to 500 feet. Disruption of the birds' migratory path, such as happens during storm events, can cause birds to fly at lower heights and be at risk of collision with the tower or other project facilities. Many of the avian fatalities at communications towers and other tall structures have been associated with steady-burning, red incandescent L-810 lights, which seem to attract birds. Evidence indicated that use of strobe or flashing lights on towers resulted in less bird aggregation and lower bird mortality than use of steady burning lights. Bright night lighting close to the ground at the project site could also attract bats and disturb wildlife that occurs adjacent to the project site (e.g., nesting birds, foraging mammals, and flying insects). Another study determined that flashing of the normally steady-burning red light (the FAA type L-810 fixture) was considered acceptable, and further determined that on tall communication towers the steady-burning lights could be extinguished altogether so long as the remaining lights flashed simultaneously between 27 and 33 flashes per minute. Flashing at faster speeds did not appear to offer any value because the light fixtures were not off long enough to reduce the attractant value to migratory birds. (Ex. 2000, p. 4.2-153.)

The PSEGS project's transmission lines may pose a collision risk to bats. Although many studies have quantified bird strikes with transmission lines, analogous information on bats is very limited. Collisions with distribution, collector, or feeder lines will likely occur to some degree; however, collision risk is not thought to pose a significant risk to

bats in the project area. The most likely collision risk for bats is associated with vehicle or equipment as bats forage near roads or work areas. (Ex. 2000, p. 4.2-153.)

Installation of heliostats could also cause an increase in Polarized Light Pollution (PLP), which typically occurs from light reflecting off of dark colored anthropogenic structures, and which has been demonstrated to be generated from even low-reflectance photovoltaic panels. It is unknown to what extent this phenomenon would occur from the heliostats. According to one study, PLP caused by anthropogenic structures can alter the ability of wildlife to seek out suitable habitat and elude or detect the presence of predators. It has also been documented that PLP can affect the ability to detect natural polarized light patterns in the sky that can negatively affect navigation ability and ultimately affect dispersal and reproduction. Polarizing surfaces are also known to disrupt insect behavior by causing some insects to react as though the surface is water and deposit eggs on polarizing surfaces. Minimization of polarizing effects was possible by adding white grids onto solar panels, or otherwise minimizing the solar active area. The extent to which heliostats could serve as an attractant is not known. (Ex. 2000, p. 4.2-153.)

One study documented insect kills (at a much smaller facility, Solar One) in excess of up 800 insects in under a minute, but the methods the authors used to make this estimate is unclear. Evidence shows that at the Solar One facility, during five days in September and October, an average of 632 insects were “incinerated” per hour. (Ex. 3032, p.26.) The rate of insect incinerations varied greatly from day-to-day and ranged from only one incineration per hour on September 21, 1982, to over 5,000 per hour on October 8, 1982. (*Id.*) The presence of insects may serve as an attractant to some species of birds and bats on the project site. (Ex. 2000, p. 4.2-154.)

Parties’ experts disagreed as to whether invertebrates were attracted to bright light during daylight hours. The evidence disclosed that there appeared to be no studies directly on point. Staff and Intervenor CBD’s experts recommended insect monitoring, while Petitioner did not. In light of the high concentrations of insect mortality reported at ISEGS, we will impose insect monitoring as part of Condition of Certification **BIO-1b**. (7/30/14 RT 279:1 – 290:5.)

There is uncertainty regarding how many birds may be killed by collisions with project features, but bird mortality is expected. The significance of such mortality in a CEQA context is uncertain and would vary depending on the number and species involved. (Ex. 2000, p. 4.2-154.)

To minimize this risk of collision and disturbance to wildlife from lights, Condition of Certification **BIO-8** specifies that the lighting atop the towers be flashing strobe lights rather than steady burning lights, and that lighting be shielded, directed downward, and turned off when not needed. The project owner has proposed use of FAA lighting systems on the project, using only red lights at night with the longest permissible interval between flashes and the shortest flash duration permissible, which would further

reduce the potential for nocturnal strikes. We have incorporated these measures into proposed Condition of Certification **VIS-3**, which directs the use, placement, and minimization of all lighting. Condition of Certification **BIO-16b**, which requires development of an Avian and Bat Protection Plan, requires the project owner to monitor, record, and report dead or injured birds found within the project footprint and, if feasible, to perform searches outside the project footprint as well. The plan also requires the implementation of remedial actions including the placement of aerial markers, ribbons, or other devices to reduce bird mortality. Monitoring of operational impacts for seasonal factors and data on species of birds affected and types of injuries or mortalities, requested by the USFWS, are considered crucial in understanding operational impacts, bird behavior, responses to stresses, and identifying and implementing measures to avoid, minimize, or mitigate impacts. However, residual impacts to avian species may exist after implementation of the conditions of certification. Condition of Certification **BIO-16b** also requires monitoring of bird mortality due to glare. The Avian and Bat Protection Plan and mortality monitoring required in Condition of Certification **BIO-16b** will effectively determine rates of bird and bat mortality from collisions with structures. Condition of Certification **BIO-16a** would implement annual funding for avian and bat conservation efforts, effectively improving habitat for birds and bats. It may not be feasible to accurately determine the rate of latent mortality when mortality occurs at a time and place removed from the project site. (Ex. 2000, p. 4.2-154.)

### **Solar Energy Flux**

Operation of the PSEGS would concentrate the sun's radiant energy (flux or solar flux) over the heliostat field. Flux levels increase approaching the power towers and occupy the airspace over the heliostat fields. Any species of bird, bat, or insect that enters this airspace and is exposed to concentrated solar flux is at risk of injury, latent mortality on or off the project site, and mortality within the project footprint. The type and severity of damage experienced is not predictable; however, it is directly linked to the duration of exposure and the intensity of the flux encountered. While safe limits of flux have been established for humans and the adverse effects of exposure well documented, little information exists to help understand what levels of flux may be safe for bats, birds, and insects. (Ex. 2000, p. 4.2-154.)

Thresholds for solar flux exposure have been established for humans and range from 1.42kW/m<sup>2</sup> (24CFR, section 51.204 appendix II) to 5kW/m<sup>2</sup> (49CFR part 193). The record indicates that there is no published threshold for avian exposure. Exposure to solar flux has the potential to result in direct and indirect effects to birds by damaging their eyes including the loss of sight, burning or singeing feathers, compromising the molecular structure of feathers (i.e., non visible damage), and secondary non visible physiological changes including elevated body temperatures or thermal stress. In some circumstances exposure to elevated levels of solar energy flux may result in the death of the bird either immediately or within a short period of time following exposure. The

potential for injury depends on a variety of factors including the size and type of bird, length of exposure, and the level of solar energy flux. (Ex. 2000, pp. 4.2-154 – 4.2-155.)

Staff formulated a thermodynamic model that establishes a theoretical level of safe exposure for avian species (excluding bats and insects), at no more than a minute of exposure at  $5\text{kW}/\text{m}^2$ . Solar flux will reach highest concentrations near the tower, likely approaching  $500\text{kW}/\text{m}^2$ , as based on information filed for two separate BrightSource projects, i.e. the Rio Mesa Solar Electric Generating Facility (RMSEGF) and the Hidden Hills Solar Electric Generating System (HHSEGS). Staff assumed that flux fields created by the PSEGS would be essentially the same as the RMSEGF, which is based on the same proprietary technology. (Ex. 2000, p. 4.2-155.)

McCrary et al. (1986) found that 13 of the bird carcasses (19 percent) at the Solar One facility had been burned, reporting that the “heavily singed flight and contour feathers indicated that the birds burned to death.” The authors interpreted these mortalities as the result of birds flying through that facility’s standby points (i.e., areas of concentrated solar energy) though they did not observe the incidents, and that mortalities may have been caused by flying within elevated flux levels surrounding the SRSR during normal operation. Risk of burning was evidently higher for aerial foragers (swifts and swallows) because of their feeding behavior. The McCrary study was based on systematic searches of the 32 hectare (79 acre) Solar One site, but not beyond the site boundaries. Thus, if any birds were injured but were able to fly beyond the site’s boundaries (about 1,200 feet from the receiver tower), they would not have been found by the field biologists and could have been scavenged before being observed. For this reason, Staff testified that actual mortality from burning may have been higher than reported. It is also possible that birds considered collision victims had suffered damage to flight feathers such that birds were unable to fly, or had experienced damage to the eyes and became disoriented, resulting in collision with the heliostats. However, the authors did not perform microscopic examination of feather structure or eyes that would make this determination possible. (Ex. 2000, p. 4.2-155.)

Petitioner initially argued that an attempt to predict and quantify the project’s potential avian mortality would be improper speculation. (Petitioner’s Opening Brief, p. 3.) Nevertheless, the PMPD concluded that substantial evidence in the record led to the conclusion that avian mortality at the PSEGS project would be a virtual certainty. (See Exs. 3057, 3059, 3060, 8019; PMPD, p. 4.2-79.) Currently, the Ivanpah Solar Electric Generating System (ISEGS) project is the only similar power plant in operation using the power tower technology that has been certified by the California Energy Commission. When the PSEGS PMPD was published in December 2013, ISEGS had not yet operated at full capacity even though it had already resulted in a number of bird deaths. (Ex. 3057; 3060.) The PMPD concluded that the Petitioner had not provided sufficient evidence to calculate a reasonable estimate of avian mortality at PSEGS. (PMPD, pp. 4.2-79.)

After the Motion to Reopen the Evidentiary Record was granted (TN 202362), Petitioner submitted further evidence to facilitate the Committee's ability to assess the magnitude of the impacts from PSEGS solar flux. The evidence included testimony based upon a compilation of avian mortality data from the Genesis Solar Energy Project (GSEP), Desert Sunlight Solar Farm and ISEGS projects, and analyses of those compilations and surveys conducted at ISEGS and PSEGS. The evidence is found in Exhibits 1133, 1134, 1135, 1138, 1154, and 1158 through 1163. Petitioner's comparative evidence was admittedly "raw" and "imperfect," and documents from the U. S. Fish and Wildlife Service (USFWS) admonished that this "incidental data should not be over-interpreted. Numerical comparisons between individual projects, project technology, or seasons are not possible in the absence of systematic, statistically rigorous mortality monitoring efforts." (Exs. 1134, p. 5; 1135, p. 4; 1154, p.2.)

Staff reviewed a report submitted by the Petitioner concerning radar surveys that were conducted for the PSEGS over 50 nights during the fall 2013 migration period from August 19, through October 31, 2013 (Ex. 1132), and a report documenting bird use, shorebird/waterfowl surveys, and avian mist net surveys conducted from August 19, through December 15, 2013 (Ex. 1131). Staff testified that Petitioner's avian surveys confirm the presence of numerous large raptors and Turkey Vultures in the PSEGS area and broaden the suite of sensitive species that are known or expected to occur on the PSEGS site. (Ex. 2017, p. 8).

The report documents 185 species of birds including 32 species considered sensitive at the state or federal level, including the state-listed Swainson's Hawk, Bank Swallow, Willow Flycatcher, and Gila Woodpecker. The Southwestern Willow Flycatcher is a federally listed species and the PSEGS project site is within that subspecies expected migratory range. Six federal priority shorebirds were also noted to use the agricultural ponds located adjacent to the PSEGS. (Ex. 2017, p. 8.)

Staff testified that the information presented in the avian mortality data and technical reports provided by the parties provide valuable information, especially regarding the types of species subject to mortality risk from exposure to solar flux, collision, and other sources at facilities representing the three technologies. Staff maintains that the avian mortality information confirms Staff's previous testimony that birds are at risk from exposure to elevated levels of solar flux, which is unique to power tower technologies. The survey data demonstrates that rare species including state and federally listed species will likely be subject to mortality from the operation of the PSEGS facility. (Ex. 2017, p. 8.).

However, Staff, along with Intervenor CBD, CRIT, and BRW, contends that the current data cannot be used to provide a meaningful estimate of the numbers of birds that would die as a result of the operation of the different facilities. Nor does the current data adequately assess the source of mortality or provide any meaningful comparison of

mortality between different solar technologies. (Ex. 2017, p. 8; Ex. 3107, p. 3; 7/30 RT 383:23 – 389:15.)

Staff cautions that the avian mortality data, which was collected randomly or incidental to other activities, is not sufficient and does not have the empirical or statistical power to accurately assess the types of risk to birds from different solar technologies. The data does not provide a reasonable estimate of the number of birds that are subject to mortality at a given location. Staff cautions that the avian mortality data submitted by the Petitioner and CBD are informative, but the power of the data to draw informed conclusions regarding the risk to birds from the operation of a solar thermal power facility is limited. (Exs. 2017, p. 9; 3107, p. 3.)

Staff testified that rigorous avian monitoring studies are underway at the ISEGS facility and preliminary data are under discussion by a Technical Advisory Committee (TAC), a collection of agency experts that have been authorized to participate in project compliance activities for that project. Surveys for this project cover approximately 20 percent of the facility and 100 percent for the areas around each tower (e.g., a circle with an approximate 800-foot radius). **Biological Resources Table 8** provides a preliminary review of avian mortality data from surveys conducted in March, April, and May 2014 on approximately 25 percent of the ISEGS site. This data was submitted to the USFWS in compliance with a Special Purpose Utility Permit (SPUP) for migratory bird mortality monitoring. In March, approximately 54 dead birds were found, 23 of which exhibited clear evidence of feather damage from solar flux. In April, 90 birds were found, 42 showing obvious flux damage. In May, 79 birds were found, 44 showing obvious signs of flux damage. This period generally conforms to spring migration periods and carcass searches were being conducted across the facility site. (Ex. 2017, p. 10.)

**Table 8 - Summary of Raw March-May Avian Mortality for the ISEGS Project.**

<b>Survey Period</b>	<b>Total Number Birds</b>	<b>Flux Injury</b>	<b>Collision</b>	<b>Other</b>
<b>March 2014</b>	54	23	2	29
<b>April 2014</b>	90	42	8	40
<b>May 2014</b>	79	44	5	30
<b>Total</b>	<b>223</b>	<b>109</b>	<b>15</b>	<b>99</b>

\*Approximately 25 percent of the area surveyed. Figures include incidental discoveries and carcass surveys but do not account for searcher bias, scavenger removal rates, nor have they been scaled up to account for the size of the project area. (Ex. 2017, p. 10.)

Staff testified that these data represent a subsample of the ISEGS project and do not take into consideration other factors that limit the power of the data to assess risk to

birds from power tower technology. Some of these include: the data has not been corrected for the rate of scavenger removal, searcher efficiency or bias, or off-site mortality (i.e., birds that are injured yet able to fly off the site but perish soon thereafter). In addition, the data have not been scaled up to account for the larger size of the PSEGS facility or adjusted for seasonal variation in avian presence. The mortality estimates do not consider birds found dead on the project site with no apparent injuries, which may still be attributed to the operation of the facility. (Ex. 2017, p. 10.)

In many instances, avian monitors find only feather spots or dead birds where the cause of death is unknown. Staff argues that some percentage of the unknown mortality sources can be attributed to the ISEGS project rather than to background mortality (i.e., natural loss through predation or other causes). (Ex. 2017, p. 11; 7/30/14 RT 371:8 – 372:17.)

Staff asserts that the location and intensity of the flux field is another important factor not considered in the monitoring data. However, when the project is in standby it still concentrates flux to dangerous levels, even when the project is not operating or running at less than full capacity. (Ex. 2017, p. 11.) Petitioner's experts testified convincingly that there is no relationship between solar flux and power production. (7/30/14 RT 390:5 – 392:6.)

At ISEGS, protocol surveys are underway and Staff indicated the collection of data at this location will provide useful information regarding the risk to birds at ISEGS. However, Staff argues that there are several important differences between the projects. First, PSEGS is located in an area known to support thousands of migrating birds including large numbers of Turkey Vultures and Swainson's Hawks. Second, PSEGS is located in an area where topographical features support migration and is close to important bird areas such as the Salton Sea and Colorado River. Third, PSEGS is substantially larger than ISEGS. (Ex. 2017, p. 13.)

Staff recommends that additional data should be collected from ISEGS before approving the PSEGS facility at this time. The data should be scaled up to account for the size of the facility and corrected for important factors such as searcher efficiency and scavenger removal rates. The data should be corrected to adjust for birds that are injured yet are able to fly off the site and avoid detection. Staff argues that none of the mortality data provides any potential for mass mortality events if flocks of birds fly through the flux field. Staff considers this a predictable event based on the large flocks of birds detected at PSEGS during autumn 2013 surveys, and that many of these species have flight characteristics or behaviors that would expose the birds to elevated levels of solar flux. (Ex. 2017, p. 12.)

### **Risk to Avian Species**

The importance of migration to avian survivorship has been generally recognized for more than two centuries and its significance has received even greater attention in the decades since then, especially during the latter years of the 20th century. There is

increasing recognition that migration is likely the most limiting time of year for migratory birds. It is during migration that the greatest number of bird species and individuals are expected to pass through the PSEGS project area. Additionally, movement characteristics of migratory birds (for example, flocking, streaming, utilization of stop-over locations, and responses to extreme weather) render them vulnerable to a host of natural and anthropogenic risks along the way. Mortality rates may be 15 times higher than those during the breeding and wintering periods when the birds are stationary. Thus, exposing birds to additional risks during migration may have even greater significance relative to individual and species survivorship (at least at the meta-population or evolutionary significant unit levels). Although several features of the PSEGS facility impose additional threats that were not found with the PSPP (e.g., power towers, large mirror arrays, generation tie-lines), Staff testified that the virtually invisible but very large fields of elevated solar flux may be the greatest of these threats to migrant and resident birds. (Ex. 2000, pp. 4.2-155 – 4.2-156.)

Species with the greatest potential to suffer adverse effects resulting from exposure to elevated levels of solar flux are expected to include members of two families: swallows (Family: Hirundinidae) and swifts (Family: Apodidae). There is existing documentation for the vulnerability of these families from previous studies at solar power tower energy generating facilities (Ex. 3026, p.5). These birds are diurnal migrants; they occur in large numbers throughout Southern California deserts and have been documented at the Palen site. In addition, the period over which these species' migrations occur is lengthy, i.e. the period between earliest and latest movements spans several months; they move at relatively slow speeds in flight (12–20 mph) and at modest heights (between 100 and 1000 feet) above the desert floor typically associated with broad streams. Individuals may feed while moving, especially if a food source (flying insects) is found opportunistically, which may increase the amount of time spent within a limited airspace. Vaux's Swift (*Chaetura vauxi*) would have similar risk patterns as swallows; however, the Vaux's Swift typically migrates through a more limited time period and often migrates in large aggregates. This latter quality renders the Vaux's Swift a species that could potentially suffer catastrophic, single-incident adverse consequences in the event a large migratory pulse encounters a region of elevated solar flux. (Ex. 2000, pp. 4.2-156 – 4.2-157.)

The Turkey Vulture (*Cathartes aura*; Family: Cathartidae), which occurs as a migrant as well as a winter and spring resident in the project area, is a highly vulnerable species due to its overall slow flight progress and reliance on thermal currents. This species has been documented on the project site during surveys conducted by the project owner. The vulnerability of this species is due to slow flight speed, static soaring flight pattern (i.e., they rarely wing-flap and are obligate soaring migrants) that often follow circuitous flight paths. This species commonly occurs within the range of elevations in which solar flux would be generated. (Ex. 2000, p. 4.2-157.)

Doves (family: Columbidae) that would be subject to risk are of two species; the Mourning Dove (*Zenaida macroura*) and the White-winged Dove (*Zenaida asiatica*). These two species occur in large numbers throughout Southern California deserts and are common migrants in the vicinity of the project area. They migrate during the day, the migration period is lengthy, their migratory flights occur in loosely-associated broad streams, and individuals may feed opportunistically along the migration route (e.g., they may stop to feed daily). Doves migrate at relatively high speeds - they are capable of sustained speeds of around 55 m/h (88 km/h), but typically at modest heights (between 100 and 1000 feet) above the desert floor in flights that may be periodically interrupted in order to feed on the ground. Doves' flight patterns are often highly erratic and typically non linear rendering them vulnerable to solar flux in spite of their rapid flight. (Ex. 2000, p. 4.2-157.)

Hummingbirds (family: Trochilidae), including Anna's Hummingbird (*Calypte anna*), Costa's Hummingbird (*Calypte costae*), Calliope Hummingbird (*Selasphorus calliope*), and Black-chinned Hummingbird (*Archilochus alexandri*) are at extreme risk during migration because they migrate during the day, must feed daily, and must locate suitable nighttime refugia. Their small size puts them at heightened risk relative to all other migrants. (Ex. 2000, p. 4.2-157.)

Several hawks (Accipiters, Harriers, and Buteos; family: Accipitridae), including the Coopers' Hawk (*Accipiter cooperi*), Sharp-shinned Hawk (*Accipiter striatus*), Swainson's Hawk (*Buteo swainsoni*), and Northern Harrier (*Circus cyaneus*) rank relatively high in terms of risk from exposure to elevated levels of solar flux. All of these are diurnal migrants whose documented occurrence in the project area, flight patterns, migration speed, and opportunistic feeding strategies render them vulnerable to regions of generated flux for significant periods when in migration. Two large buteos, the Red-tailed Hawk (*Buteo jamaicensis*) and the Ferruginous Hawk (*Buteo regalis*), which are also diurnal migrants, would likely be at a lower risk primarily due to their lower expected numbers at the project site. (Ex. 2000, p. 4.2-157.)

Several occurring flycatchers (family: Tyrannidae) including the state endangered Northwestern Willow Flycatcher (*Empidonax traillii brewsteri*), Western Kingbird (*Tyrannus verticalis*), Gray Flycatcher (*Empidonax wrightii*), Western Flycatcher (*Empidonax difficilis*), and Ash-throated Flycatcher (*Myiarchus cinerascens*), all of which are primarily nighttime migrants, exhibit extensive daytime movements during which feeding is an important behavior. Although their nocturnal migration habits minimize overall threat of exposure to elevated levels of solar flux, their documented occurrence, flight patterns, speed during diurnal movements, and requisite fly-catching/hawking feeding behaviors render them vulnerable to some degree. The common raven (*Corvus corax*) is ranked similarly in many threat categories with the higher risk species of Turkey Vultures. (Ex. 2000, p. 4.2-158.)

Another species that may be at risk is the House Finch (*Haemorhous mexicanus*; family: Fringillidae). Though not an obligatory migrant, this species may occur in small numbers as migrants, and is a regular fall, winter, and spring resident that probably includes a breeding population. Local meta-populations of House Finch families may swell into post-breeding agglomerations of between scores and hundreds. Movements of these groups may place relatively large numbers of individuals at risk from exposure to elevated levels of solar flux. (Ex. 2000, p. 4.2-158.)

Less predictable species, for which adequate occurrence data are lacking, that may be at risk because of their flight patterns and behaviors include thrashers (family: Mimidae), especially the Sage Thrasher (*Oreoscoptes montanus*), Nighthawks (family: Caprimulgidae), especially the lesser Nighthawk (*Chordeiles acutipennis*), grosbeaks (family: Cardinalidae), especially the Black-headed Grosbeak (*Pheucticus melanocephalus*), several species of blackbirds (family: Icteridae), including the Red-winged Blackbird (*Agelaius phoeniceus*) and the Brewer's Blackbird (*Euphagus cyanocephalus*), and owls (family: Strigidae) including Burrowing Owl (*Athene cunicularia*), Short-eared Owl (*Asio flammeus*), and Long-eared Owl (*Asio otus*). (Ex. 2000, p. 4.2-158.)

Conversely, some birds will likely be at lower risk from exposure. Resident species such as the Verdin (*Auriparus flaviceps*), Black-tailed Gnatcatcher (*Poliioptila melanura*), Gambel's Quail (*Callipepla gambelii*), along with many ground-feeding, seed-eating, winter resident/nocturnal spring migrant species such as Brewer's Sparrow (*Spizella breweri*), Horned Lark (*Eremophila alpestris*), and Black-throated Sparrow (*Amphispiza bilineata*) may be less likely to succumb to flux-related impacts due to several factors. Their nocturnal migration, ground-based feeding, consequent low-elevation flight (i.e. relative to projected height above ground or areas of expected elevated levels of solar flux), and loss of foraging habitats within the project area may make them less vulnerable to the operation of the PSEGS. (Ex. 2000, p. 4.2-158.)

As described above, Staff testified that extended exposure to high-intensity solar flux would likely kill birds. Staff also testified that shorter exposures to high-intensity solar flux would cause tissue or feather damage that could impair flight or vision, or cause physiological effects that ultimately cause or contribute to mortality from other causes (e.g., reduce ability to forage, escape from predators, or thermoregulate). Staff opines that longer exposures to lower-intensity solar flux levels are likely to cause feather damage or physiological effects. (Ex. 2000, p. 4.2-158.)

Staff's testimony describes in detail the function and physiology of feathers and plumage. Staff provided detailed information regarding the importance of flight performance to avian survival and how flux injury would vary depending upon the size of the bird, its coloration, and plumage. Staff concluded that birds flying through energy flux in excess of safe thresholds will likely suffer significant damage to flight feathers, eyes, or skin. In some cases, where they fly through higher flux levels, these birds will

fall to the ground with evidence of severe burning. Staff hypothesizes that many birds may continue flying for a few seconds or minutes, perhaps long enough to escape the hazard, but will be unable to fly effectively, find food, or escape predators and will die a short time after the exposure, or persist for longer periods but with reduced reproductive success. (Ex. 2000, p. 4.2-159 4.2-163.)

Staff's testimony indicated that some birds exposed to concentrated solar flux will be at risk of suffering (1) hyperthermia, which may result in disorientation and/or other damaging physiological repercussions and, depending on time and level of exposure (2) feather damage with a consequent flight impediment, or anatomical effects such as tissue damage, and temporary or permanent vision impairment. These effects are influenced by both the dose level and exposure time. Staff considered these effects significant and unmitigable based on the species affected and the severity of the impact. (Ex. 2000, p. 4.2-163.)

Staff calculated that the PSEGS flux field would occupy 3.8 times the volume of the ISEGS flux field on a per-tower basis. Staff found that avian mortality increased nearer to the tower. Finally, Staff found that the 250-megawatt solar tower at 240 meters high, as is proposed for PSEGS, would present a risk that is 3.7 times higher per tower than that presented by a 125-megawatt ISEGS solar tower at 120 meters g. (7/30/14 RT 276:5 – 277:14.) Nevertheless, Staff did not offer any estimate for avian mortality due to solar flux. (7/30/14 RT 393:22-23.)

Petitioner's experts estimated that approximately 665 to 1,228 flight paths of birds would be exposed to solar flux within the danger zone per year without deterrence. Of the taxonomic groups investigated, and using the more conservative assumptions, Petitioner's expert testified that passerines would have the potential for the highest level of exposure (229 – 764), while Turkey Vultures are the second most common group identified (332). Other large bird taxonomic groups that are expected to have some potential exposure include diurnal raptors (30), with buteos (16) having the most potential for exposure, followed by falcons (7). Petitioner's expert testified that the estimate based upon Staff's assumptions could increase to between 1,400 and 2,200 birds per year. However, bird deaths would not number in the tens of thousands. (Ex. 1134, p.8; 7/30/14 RT 242:5-11; 256:14-259:13.)

Intervenor CBD's expert testified that the available data was "too incomplete" and not sufficient to predict fatality rates. (7/30/14 RT 388:2 – 389:15.)

Given the record before us, we are unable to estimate with any level of certainty what the magnitude of the solar flux impacts to avian species would be. In light of preliminary avian mortality data from the ISEGS project, we find that the solar flux impacts to avian species remain significant. We also find that there is insufficient data to identify with any accuracy the extent of potential injuries or the efficacy of the mitigation measures proposed. Therefore, we conclude that, at this time, the solar flux impacts are both significant and unmitigable.

## Proposed Mitigation

The record indicates that the Petitioner proposed three avian conditions of certification containing mitigation for avian and bat impacts. The first proposed condition offered compensatory mitigation at a 1:1 ratio for habitat impacts (approximately 3,794 acres of habitat), with selection criteria that would ensure the acquisition of high quality habitat. This acreage was intended to “nest” within Desert Tortoise mitigation (e.g. lands acquired would be comparable to habitat impacted by construction of the project), and would not entail additional offsets outside of those required for Desert Tortoise mitigation, given that all selection criteria are met. These lands would be managed and preserved in perpetuity. (Ex. 2000, p. 4.2-164.)

The second condition, Avian Enhancement and Conservation Measures, offered further avian mitigation in a two-pronged approach: the project owner would fund the retro-fit or installation of avian diverters at non APLIC compliant power poles within the greater vicinity of the project and has pledged an amount of \$300,000 towards this effort to be held in trust under the National Fish and Wildlife Foundation’s Bald and Golden Eagle Protection Act Account. The other part of this condition would mitigate for losses of migratory birds through funding of conservation actions. The project owner has offered \$500,000 towards this effort and has identified the following 11 conservation areas as having benefit to migratory birds:

1. Restoration of degraded habitat with native vegetation;
2. Restoration of agricultural fields to bird habitat;
3. Movement of agricultural fields to enhance bird populations;
4. Invasive plant species and artificial food or water source management;
5. Control and cleanup of potential avian hazards such as lead or microtrash;
6. Retrofitting of buildings to minimize collisions;
7. Retrofitting of conductors and above-ground cables to minimize collisions;
8. Animal control programs;
9. Support for avian and bat research and/or management efforts within mitigation lands acquired pursuant to Desert Tortoise mitigation (**BIO-12**);
10. Funding efforts to address avian diseases or depredation due to the expansion of predators in response to anthropomorphic subsidies that may adversely affect birds; and
11. Contribute to the Migratory Bird Conservation Fund managed by the Migratory Bird Conservation Commission. (Ex. 2000, p. 4.2-164.)

The third proposed condition, Avian and Bat Surveys, Monitoring and Adaptive Management, outlines an extensive on-site program designed to monitor operational effects and to outline a pathway toward managing those impacts on an ongoing basis.

These efforts would be memorialized in a Birds and Bat Conservation Strategy (BBCS). The proposed condition details various efforts including monitoring bird and bat use at the site, evaluation of wildlife behavior at the project site in comparison with the behavior of birds in an unaltered environment, implementing on-site mortality and injury monitoring to gauge operational effects of the project, identify conservation measures to minimize impacts, and develop and implement an adaptive management framework to respond directly to the results of project monitoring. The condition proposes monitoring Golden Eagle nest locations within 10 miles of the project site. (Ex. 2000, p. 4.2-165.)

Staff did not recommend adoption of the project owner's offer of 1:1 habitat offsets for avian and bat species. While acquisitions are valuable and ensure long-term preservation of habitat, Staff believes that the requirements of **BIO-12** are equally conservative, ensuring acquisition of high quality habitat for the Desert Tortoise that would also benefit avian species. Additionally, the stated selection requirements would likely "nest" or overlap with the Desert Tortoise offsets and, therefore, would not ultimately result in acquisitions further than already recommended within **BIO-12**. Habitat acquisition is a useful tool. However, when attempting to mitigate potential ongoing losses of such a mobile and diverse group of vertebrates such as migratory birds, in particular, and insects and bats to a lesser degree, restoration and enhancement of habitat may prove more useful than placing conservation easements. Restoration of habitat is one of few means of "creating" new habitat and has the possibility of expanding both abundance and, in some instances, the range, of birds, bats, and insects. (Ex. 2000, p. 4.2-165.)

The Petitioner offered \$500,000 towards funding various habitat enhancement and conservation actions, and Staff has also recommended this. However, rather than payment of a lump sum, Staff recommend that the project owner fund an interest-bearing account to achieve this same goal. Monies held in an interest-bearing account would be managed by a non profit investment entity (e.g., a community foundation such as the Imperial Valley Community Foundation) from which only annually earned interest and fund management fees may be distributed; that is, the investment vehicle would be designed and managed as an interest-bearing account. (Ex. 2000, p. 4.2-165.)

Staff testified that a minimum annual benefit of approximately \$50,000 would be necessary to fund bird mitigation actions during the operational life of the project. Staff testified that in order to yield approximately \$50,000 annually, the project owner would need to provide approximately \$1,500,000 into an interest-bearing account. The recommended funding amount was determined by considering three primary factors:

1. A reasonable/achievable rate of capitalization (4.0% per annum);
2. Adequacy of the amount of the investment to allow for portfolio diversification;
3. An annual funding amount of significant benefit to the affected resource (Ex. 2000, p. 4.2-166); and

4. The actual funds needed to support this program may vary. While this approach is more costly than originally proposed by the Petitioner, Staff believes the approach is reasonable and may provide indirect benefits to the project owner, primarily that funds would be available to the project owner at the end of the project, annual payouts would not incur tax liabilities, the program would provide not only annual revenue for an extended period but does so in a fiscally responsible manner, and the level of funding is expected to provide a significant, demonstrable, and measurable mitigation value that is linked directly, both spatially and temporally, to facility operation. (Ex. 2000, p. 4.2-166.)

Alternatively, the project owner may pay \$50,000 annually to fund the conservation activities for the life of the project. If the project owner elects to make annual payments, the annual payments would be adjusted for inflation. (Ex. 2000, p. 4.2-166.)

According to Staff, Condition of Certification **BIO-16a** is designed to compensate for death, injury/morbidity, and/or generally reduced reproductive success of individuals or a distinct population segment or segments of bird and bat species resulting from adverse contact with elevated levels of solar flux, mirror-related disorientation, and power tower collisions. The specificity of this condition links the mitigation directly to project component-specific impacts and, furthermore, links the funding of the mitigation measure solely to the period of project duration. The funding for this mitigation measure does not involve the establishment of an endowment that is intended to provide a funding mechanism in perpetuity. This mitigation measure is separate from all other project-related mitigation measures and responds directly to the question posed by the REAT agency biologists; namely, how to mitigate for flux-related adverse effects to migratory birds, insects, and bats during the operational life of the PSEGS. (Ex. 2000, p. 4.2-166.)

Staff further testified that implementation of conditions **BIO-16a** and **BIO-16b** would require the project owner to monitor, record, and report bird deaths and injuries from project construction and operation. Monitoring the project's operational impacts for seasonal factors, the species of birds affected, and the types of injuries or mortalities that occur have also been requested by the USFWS. This type of monitoring is considered crucial in documenting bird behavior, noting responses to stress, quantifying impacts, and subsequently identifying and implementing any available measures to avoid, minimize, or mitigate these impacts. If take occurs, it would be reported to the REAT agencies for further action. (Ex. 2000, p. 4.2-168.)

Condition of Certification **BIO-16b** requires development of avian, bat, and Golden Eagle protection plans. These plans require development of project monitoring methodology and implementation of compensatory mitigation according to clear performance standards provided in the condition, should monitoring reveal significant impacts to avian or bat species. This mitigation would be implemented as needed based on the levels of take revealed by monitoring, and would detail all appropriate

minimization and compensatory actions as determined in consultation with USFWS, CDFW, the BLM, and the Energy Commission. These actions would vary from restoration of avian habitat that supports the species impacted by the project, power line retrofits or other means of minimizing take and enhancing habitat, and would allow for flexibility in measures imposed based on effectiveness monitoring. These plans would also incorporate a means of accounting for individuals that may suffer damage from exposure to elevated levels of solar flux, yet still be capable of flying off the site. These animals would not be detected during on-site carcass searches, yet would be adversely impacted by the project. (Ex. 2000, p. 4.2-168.)

While data collection is important and could potentially inform new mitigation or adaptive management strategies, feasible mitigation to reduce impacts to avian species from exposure to elevated levels of solar energy flux or irradiance to below the level of significance may not be possible. This is because the proposed mitigation may not avoid bird mortality and mitigation would not replace birds in the local population that would be killed by solar flux exposure, particularly fully protected and other special status birds. (Ex. 2000, p. 4.2-168 – 4.2-169.)

According to Staff, eliminating harmful levels of solar flux would reduce risk to avian species. However, given the operational mechanics of this technology and the inability to detect and identify birds or determine their flight path from a far enough distance, Staff is not confident that temporary curtailment would be an effective mitigation approach. (Ex. 2018, pp 9-10.) Seasonal curtailment, such as requiring the project to curtail operations for a particular duration of time, may be effective, but only after data are gathered to show that the project is having harmful impacts to an at-risk species at a consistent time each year. (Ex. 2017, p. 18.) At this time, without any such data, Staff does not believe this would be a useful mitigation approach and has not recommended including a curtailment provision in any condition of certification. (Ex. 2018, p. 11.)

Petitioner submitted undisputed evidence establishing that curtailment was not a feasible measure in mitigation due to the slowness of the heliostats to react to a command to reposition into stow mode. (Exs. 1136 & 1137.) Although, CBD supports seasonal curtailment (CBD 8/15/14 Opening Brief, p. 8, fn. 9), there is no evidence in the record to contradict Petitioner's evidence on the infeasibility of curtailment as mitigation. CBD's expert testified that there is no evidence that curtailment as a mitigation strategy at wind farms was effective. (Ex. 3144, pp. 2; 4.)

Finally, Petitioner offered a wide array of deterrent options to prevent birds from entering the solar flux field (Ex. 1130). Staff reviewed Petitioner's deterrence evidence and concluded that some deterrence would not work at all and others may have some effect, but Staff would not say that any of the deterrent methods would reduce the impact significantly. (Exs. 2017, pp. 21-21; 2018, pp. 3-5.) Further, Staff suggests that some of the deterrent methods themselves may have impacts to biological resources

that will need to be mitigated. (*Id.*) CBD's expert expressed skepticism regarding the efficacy of any deterrent methods. (7/30/14 RT 422:3 – 11.)

CRIT and CBD argue that deferral of formulation of mitigation measures without performance standards is unlawful (CRIT 8/15/14 Opening Brief, pp. 16-17; CBD 8/15/14 Opening Brief, pp. 23-25). Specifically, CBD observes that mitigation measures for avian mortality due to solar flux would not be fully formulated before project approval and the cases have consistently required specific performance criteria to ensure adequate mitigation measures would eventually be implemented (*Id.*). CBD further contends that many of the suggested deterrence and mitigation measures have not been shown to be feasible, enforceable, or fully funded. (*Id.*)

Petitioner counters that performance standards are typically used to ensure that mitigation is successful in reducing impacts to below a level of significance. However, when an agency acknowledges the impact is significant and cannot be mitigated to less than significant levels, the use of performance standards is helpful, but not necessary, since the agency is not relying on the performance standard to determine the impact will be fully mitigated. Petitioner has requested the Committee to make a finding of “override” acknowledging the uncertainty involved in the estimation of impacts, the effectiveness of deterrent methods, and the ultimate application of the mitigation funds. Since the CEC would not be relying on the performance standards to conclude that the solar flux impacts are mitigated to less-than-significant levels, the CEC should consider the performance standards Petitioner proposes as supplemental and not intended to ensure full mitigation. Petitioner cites *San Diego Citizenry Group v. San Diego* (2013) 219 Cal.App 4th 1. (Petitioner's 8/15/14 Opening Statement, p. 20.)

CEQA requires a lead agency to mitigate or avoid the significant effects on the environment of projects that it carries out or approves whenever it is feasible to do so. (Pub. Resources Code, § 21002.1(b).) The law is clear that mitigation must be feasible and enforceable (*Gray v. County of Madera* (2008) 167 Cal.App.4<sup>th</sup> 1099). The law is also clear that deferred mitigation is impermissible unless the lead agency commits itself to mitigation and either (1) adopts a performance standard and makes further approvals contingent on finding a way to meet the standard, or (2) lists alternative means of mitigating the impacts that must be considered, analyzed, and possibly adopted in the future (*Endangered Habitats League v. County of Orange* (4th Dist. 2005) 131 Cal. App.4th 777).

CEQA does not require that we deny or delay a project due to the fact that it is impossible to precisely identify a project's potential impacts or the effectiveness of mitigation measures. However, any decision to approve such a project must encourage informed decisionmaking and public participation, and ensure that feasible mitigation measures and alternatives that significantly reduce or avoid significant unmitigable impacts are employed.

These standards guide our decision, and our decision is a difficult one. The record indicates that solar flux likely causes harm to birds, bats, and insects, but that the magnitude of the harm cannot be accurately ascertained due to a dearth of information. In fact, it is only from operational data that cannot be collected until *after* the project is operational that we will be able to understand how solar flux affects these fauna at this location. Although there is preliminary data from other solar power tower facilities, it is not of sufficient amount or quality to draw accurate conclusions about what will occur at PSEGS. (Ex. 2017, p.14.) Similarly, while the data from ISEGS can inform our Decision, it too is of a preliminary nature and reflects technological differences and different site conditions, reducing its usefulness in drawing conclusions about PSEGS. Additionally, preliminary information about the effectiveness of deterrence methods is not robust enough to allow us to reach conclusions about the ability of these methods to provide meaningful mitigation. Because of the magnitude of flux projected at this facility and the uncertainty of the resultant impacts, we have found herein that the solar flux impacts are significant, and likely unmitigable. As noted above, CEQA requires us to impose all mitigation that is feasible to reduce these impacts; it does not allow us to use an override in lieu of feasible mitigation. Thus, we agree with the statements of CRIT regarding the use of an override to subvert CEQA's mandate that a lead agency must mitigate or avoid the significant effects on the environment of projects that it approves whenever it is feasible to do so. (CRIT 8/15/14 Opening Brief, p. 10.)

As a result, we are requiring all the mitigation that we find to be feasible to address potential flux impacts. Some of these measures are quite specific. But the dearth of information about flux impacts calls for a robust monitoring and adaptive management program with some specific measures selected only after data about the type and extent of impacts is available. This approach will include the monitoring activities that constitute the only means by which we can 1) understand the nature and extent of flux impacts, and 2) identify which specific measures will ensure a reduction in injury and mortality to fauna at risk from solar flux.

In developing Conditions of Certification **BIO-16a** and **BIO-16b**, with respect to species that are fully protected under the California Fish and Game Code (Golden Eagle, Bald Eagle, American Peregrine Falcon, and Yuma Clapper Rail, among others), mitigation is provided for potential ongoing direct loss of individuals from project operation. However, even if project impacts to Golden Eagles and other fully protected species can be mitigated to less than significant under CEQA, take of fully protected species is not permissible under another state law. Take of Golden Eagles or other fully protected species would violate the Fish and Game Code sections known as the Fully Protected Species Act (Cal. Fish & Game Code, § 3511). However, the CDFW may allow the take of some fully protected species, including Golden Eagles, through the context of an adopted Natural Community Conservation Plan (NCCP) (see Cal. Fish & Game Code § 2835). Although not yet adopted, the DRECP (an NCCP) is anticipated to provide coverage for some fully protected species, including the Golden Eagle. If the PSEGS

project falls within a development focus area as determined by the final DRECP, then it is possible that the PSEGS project owners would eventually be able to apply for a take permit of otherwise fully protected species through the DRECP (see *Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 233, 128 Cal.Rptr.3d 733, 759 citing Cal. Fish & Game Code, § 3511). (Ex. 2000, p. 4.2-168.) We note that there is nothing in Conditions of Certification **BIO-16a** and **BIO-16b** that requires the project owner to apply for any such permit.

Condition of Certification **BIO-16b** requires a series of actions to develop the information needed to understand the risks of solar flux, and provide adaptive management, including rehabilitation, deterrence and other operational measures to minimize impacts. In addition, because of the uncertainty about the ability of these measures to eliminate or substantially lessen significant impacts, we are also requiring the project owner to establish a \$10 million Mitigation Contingency Fund to be used for additional conservation measures to enhance populations of affected species should monitoring demonstrate that deterrence and operational measures and other mitigation implemented by condition **BIO-16a** do not prevent significant impacts. The Condition requires the CPM to facilitate and coordinate concurrent review of monitoring data and selection of adaptive management actions with the BLM, USFWS, and CDFW. We have removed the proposed formation of a TAC from condition **BIO-16b**. Nevertheless, the Energy Commission intends through this condition that the CPM coordinate with these agencies to the maximum extent to devise consistent monitoring approaches, develop scientific information, and coordinate implementation of the adaptive management measures to reduce duplication and ensure consistency. Staff has conferred with various agencies to determine where conservation opportunities may exist; a partial list of these is included in Condition of Certification **BIO-16b**.

Finally, Condition of Certification **BIO-16c** contains those mitigation measures that are specific to the project's potential impacts to Golden Eagles.

To summarize, the solar flux impacts are significant and unmitigable. As part of the attempts to mitigate the solar flux impacts, after approval of the amendment, the CPM is directed to coordinate with the other state and federal wildlife agencies to review bird, bat, and insect surveys that the project owner is required to perform to determine a baseline of mortality and assess the types and severity of impacts as well as the likely causes and solutions. The project owner will be responsible for ongoing monitoring activities and for employing adaptive management that the CPM and the wildlife agencies recommend after reviewing the data once project operations commence. The specific measures may include deterrence and operational measures which show promise, but cannot be relied on at this time due to the lack of operational data. In addition, we require the project owner to establish a \$10 million fund to be used for additional conservation measures such as programmatic habitat acquisition or restoration activities should monitoring data demonstrate that deterrence and operational measures and the other mitigation implemented by condition **BIO-16a** are

inadequate to prevent significant impacts. In conclusion, we find that while it is possible that these measures may reduce impacts to a level that is not significant, there is insufficient evidence to make a finding of insignificance at this time. Although we would prefer to be able to identify specific mitigation that we would be sure would reduce impacts to a level that is not significant, we find that it is not possible to do so given the paucity of information about the extent and nature of flux impacts. The approach we adopt today provides the best means for ensuring that reductions in injury and mortality to fauna from solar flux will be reduced.

The solar flux impacts are significant and unmitigable. However, as shown in the Statement of Overriding Considerations, we find, notwithstanding our inability to identify the precise level of unmitigable impacts that will occur, that the benefits of the project outweigh the impacts. The nascent nature of the power tower technology will require a period of operating experience. Over time, the unknowns that surround the solar flux impacts and mitigation will become known, but that knowledge will only come through the experience gained from allowing the project to operate with the rigorous monitoring, mitigation, and adaptive management required in Condition of Certification **BIO-16b**. We are satisfied that Condition of Certification **BIO-16b** constitutes the best way to mitigate solar flux impacts available at this time; therefore, we will impose Condition of Certification **BIO-16b** even though the mitigation may not reduce the solar flux impacts to biological resources to below significance.

### **Evaporation Ponds**

The PSEGS project's modifications include the reduction from two double-lined, four-acre evaporation ponds to two double-lined, two-acre evaporation ponds. These ponds will receive industrial waste streams that would primarily come from the PSEGS project's auxiliary cooling tower and boiler. (Ex. 2000, p. 4.2-169.)

A variety of waterfowl and shorebirds could seasonally use evaporation ponds as resting, foraging, and nesting areas. Evaporation ponds in the Sonoran Desert pose several threats to wildlife. First, creation of a new water source to an area where water is scarce would attract ravens to the PSEGS project, potentially increasing predation rates on juvenile Desert Tortoises in adjacent habitat. Second, waterfowl, shorebirds, and other resident or migratory birds that drink or forage at the ponds, or Couch's Spadefoot Toads and their eggs could be harmed by selenium or hyper-saline conditions resulting from high total-dissolved-solids concentrations that would exist in the waste contained in the evaporation ponds. Monitoring results from 2007 and 2011-2012 at NextEra Harper Lake Solar Electric Generating System (SEGS) VIII and IX located near Harper Lake in the Mojave Desert revealed that numerous waterfowl, primarily Eared Grebes, died at the evaporation ponds due to salt toxicosis. Third, these ponds may attract birds, bats, and insects to the project site, exposing them to solar flux and collision risks. (Ex. 2000, p. 4.2-169.)

Condition of Certification **BIO-26** requires installation of netting over the evaporation ponds to exclude birds and other wildlife, as well as a monitoring program to ensure the effectiveness of exclusion. Implementation of this measure would reduce evaporation pond impacts to birds and other wildlife to less-than-significant levels. The use of netting over ponds has its own drawbacks, primarily that birds may become entangled in netting from time to time and be unable to escape. Staff believes that even with this risk, netting the evaporation ponds is still a better choice than leaving them uncovered, because of the known risk of salt toxicosis to wildlife. Staff researched additional means of making the evaporation ponds unappealing to wildlife; preliminary data shows that the addition of an orange or red colorant has served as a deterrent, as well as placement of large floating rafts in the ponds. Staff still has not found a solution that reasonably appears to be a lower risk than netting. (Ex. 2000, p. 4.2-169.)

### **Cumulative Impacts to Special Status Avian Resources**

Proposed future projects within the NECO planning area and Chuckwalla Valley would cumulatively displace substantial amounts of foraging and/or nesting habitat for other special status species including the state-threatened Le Conte's Thrasher, Swainson's Hawk, Yuma Clapper Rail, Gilded Flicker, Elf Owl, Osprey, Ferruginous Hawk, Burrowing Owl, Cooper's Hawk, Bald Eagle, Sharp-shinned Hawk, Northern Harrier, Prairie Falcon, Peregrine Falcon, Harris Hawk, and Short-eared Owl (this is not a comprehensive list). The project's contribution to the cumulative loss of habitat is comparable to the cumulative loss of eagle habitat described above and would be consistent with the Commission's Decision for the PSPP. Staff concluded that the loss of habitat from all proposed future projects would be significant, and the project's contribution to that effect is cumulatively considerable. The project would also contribute a cumulatively considerable impact to habitat fragmentation and edge effects, noise and lighting, increased road kills, increased risk of fire from weed invasion and increased ignition sources (vehicles), all of which ultimately degrade the function and values of the remaining habitat. The project's contribution to these indirect effects and loss of habitat would be mitigated to a level less than cumulatively considerable through avoidance and minimization measures in **BIO-8**, **BIO-14** (Weed Management Plan) and **BIO-27** (Revegetation of Temporarily Disturbed Soils) to address the project's contribution to the spread of Sahara mustard and other weeds, **BIO-12** for acquisition of 4,860 acres of Desert Tortoise habitat, which is expected to contain suitable habitat for many resident and migratory birds, **BIO-15**, which requires pre-construction nesting bird surveys, **BIO-23** and **BIO-24**, which would require monitoring for impacts to groundwater-dependent vegetation around Palen Dry Lake and remedial action if adverse effects are detected, and **BIO-21**, which requires acquisition and protection of desert washes and adjacent habitat within the local watersheds, which would minimize future fragmentation in the Chuckwalla Valley. The Energy Commission determined that cumulative effects to most resident and migratory birds from construction of the PSPP would be mitigated to less-than-significant levels; however, the risk to these birds from exposure to elevated

levels of solar flux for the PSEGS would be cumulatively considerable even with the implementation of Conditions of Certification **BIO-16a** and **BIO-16b**. Many species of birds have been observed, or are expected to occur, in or near the site and have flight characteristics that place them at operational risk during the life of the project. (Ex. 2000, pp. 4.2-204 – 4.2-205.)

The Le Conte's Thrasher is showing steep population declines due to loss of habitat resulting from urbanization and water use combined with prolonged drought. Climate change is expected to exacerbate drought and compound the impacts of surface and groundwater use in the desert region. Further loss, fragmentation, and degradation of habitat could cause local extirpations and imperil Le Conte's Thrashers in the Mojave and Sonoran Deserts. The cumulative effects from foreseeable future projects on habitat loss are substantial. Although the project's contribution to these effects is individually minor, it nevertheless contributes, at least incrementally, to a cumulatively considerable effect. (Ex. 2000, p. 4.2-205.)

This species may also be at risk from operation of the facility from collisions or exposure to elevated levels of solar flux. The project's contribution to the cumulative loss of Le Conte's Thrasher habitat and indirect effects will be minimized through implementation of the following conditions of certification (consistent with the PSPP Commission's Decision): **BIO-2**, which requires acquisition and enhancement of 788 acres of desert dry wash woodland to be mitigated within the same local watersheds as the site of the impact; **BIO-15**, which requires pre-construction nesting bird surveys; **BIO-16**, which requires monitoring of bird kills and adaptive management; **BIO-23** and **BIO-24**, which would require monitoring for impacts to groundwater-dependent vegetation around Palen Dry Lake and remedial action if adverse effects are detected; and **BIO-8**, which includes measures for minimizing the effects of noise, lighting, traffic, and other impacts. **BIO-21** would also minimize future fragmentation in the Chuckwalla Valley region by permanently protecting these critical resources from future development and its associated indirect effects. (Ex. 2000, pp. 4.2-205 – 4.2-206.)

The Energy Commission determined that cumulative effects to Le Conte's Thrasher from construction of the PSPP would be mitigated to less-than-significant levels; however, the risk to Le Conte's Thrasher from exposure to PSEGS elevated levels of solar flux would be cumulatively considerable even with the implementation of Conditions of Certification **BIO-16a** and **BIO-16b**. These birds appear in low densities and have flight characteristics that place them at operational risk during the life of the project. CEQA Guidelines, § 15065, requires a finding of mandatory significance if the project has the potential to "reduce the number or restrict the range of a rare or endangered plant or animal."

All of these species may be vulnerable to operational impacts including collision with heliostats or other project facilities and injury or mortality from exposure to solar flux. We find that the project's contribution to significant cumulative effects to all avian

species (resident and migratory birds) is cumulatively considerable when combined with the anticipated indirect effects to remaining habitat and populations. Anticipated indirect effects may remain cumulatively considerable even with the application of mitigation. These effects differ from the Commission's Decision for the PSPP, which did not propose power tower technology. (Ex. 2000, p. 4.2-215.)

## **SPECIAL-STATUS MAMMALIAN SPECIES**

### **Bats**

The PSEGS project will adversely affect bats through the removal of foraging habitat. The entire project site is expected to support bat foraging, in particular desert dry washes where increased presence of vegetation, especially microphyll woodland, would support a broad variety of insect prey items. Approximately 850 acres of agricultural development (jojoba and palm farms) lie immediately adjacent the project. There are two private pools approximately two acres or less in size associated with these farms. Agriculture may support foraging by the species if they support appropriate insect fauna, because the plantation is irrigated and it is expected to support a host of unexpected insect species. The presence of an evaporation pond within the project may similarly serve as an attractant for insects and, therefore, may attract bats for foraging. (Ex. 2000, p. 4.2-143.)

Loss of roosting habitat is another impact of the PSEGS project. Suitable roosting habitat for bats within the modified project and linear features includes washes with large trees within the southern portions of the modified project in the central wash, and around the transmission line and substation. Large washes with riparian vegetation meander through the southern portion of the buffer around the transmission line and substation south of I-10. Some large trees are located within the southern portion of the central wash in the modified project. Large trees with exfoliating bark, tree cavities, rock crevices, bridges, and other locations may provide suitable roosting habitat for a variety of bat species within the modified project and buffer. Bat roosts are known to occur in the project area. Bat roosts are also known to occur in Eagles Nest Mine (Little Maria Mountains) and Paymaster Mine in the project vicinity. Additionally, the taller ornamental palm trees within the plantation may be utilized for roosting by bats including Western Yellow Bats. (Ex. 2000, p. 4.2-143.)

The majority of adverse impacts to bat populations in the region result from disturbance of roosting or hibernation sites, especially where large numbers of bats congregate, physical closures of old mine shafts that eliminate roosting habitat, elimination of riparian or desert wash microphyll vegetation that is often productive foraging habitat, more general habitat loss or land use conversion, and agricultural pesticide use that may poison bats or eliminate their prey-base. (Ex. 2000, p. 4.2-143.)

Staff believes that impacts to bats may be caused by collisions with stationary project features such as the tower and heliostats, as well as moving objects such as construction equipment and other moving vehicles, particularly during periods of night

time construction. Other on-site practices that increase available water, such as mirror washing, dust control, and leaks/spills when filling water trucks may attract insects, in turn attracting bats to the site. Increased vehicle presence on access roads and the I-10 freeway may also adversely impact bats. Bats are known to collide with stationary objects, such as windows and television towers, and of these collisions, many involved illuminated objects that should have been detected by vision, if not certainly by echolocation. Bats do not maneuver solely using echolocation; in fact, some bats have very good eyesight, such as *Macrotus californicus*, a species that feeds by gleaning insects and, therefore, would need to clearly see them against foliage in order to eat them. There are several species of bats likely foraging at the site that also feed by gleaning, such as the Pallid Bat. While bat vision is adapted for long-distance use and even exceeds echolocation ranges, the short-range visual capability of bats is poorly understood. (Ex. 2000, p. 4.2-143.)

While much documentation of road-kill mortality has focused on terrestrial mammals, birds, reptiles and amphibians, the impact of highways on bat populations has only recently been identified. During studies along a highway conducted in 2009, one study found carcasses of *Myotis lucifugus* and *Myotis sodalis* that were killed by vehicles. During telemetry studies in 2000, bats were observed crossing US Route 22 as they emerged from the roosts at dusk, and road-killed bats were noted. (Ex. 2000, p. 4.2-144.)

A year's worth of data was collected along a section of road revealing 61 road-killed bats belonging to seven species. The frequency of detection of carcasses varied both seasonally and by the type of habitat surrounding the roadside. Interestingly, species that were struck ranged in typical flight elevations, and the authors' hypothesis that low-flying species would be killed more frequently was not confirmed. (Ex. 2000, p. 4.2-144.)

Conditions of Certification **BIO-1** through **BIO-8** minimize overall project impacts to habitat, require worker training to minimize disturbances, biological monitoring and reporting of project disturbances, and compensate for habitat loss through the acquisition and management of off-site lands, including offset for dry desert wash habitat at a 3:1 ratio. We find that these measures would effectively mitigate foraging habitat impacts for special-status bats. (Ex. 2000, p. 4.2-144.)

As discussed in the **Cumulative Impacts to Special Status Avian Resources** subsection, Staff considers the project to be a substantial contributor to the cumulative loss of habitat for the NECO planning area biological resources, including habitat for these special-status bats. Condition of Certification **BIO-12**, the Desert Tortoise Compensatory Mitigation Plan, and **BIO-21**, Mitigation for Impacts to State Waters, would offset the cumulative loss of habitat for these species. (Ex. 2000, p. 4.2-144.)

### **American Badger and Desert Kit Fox**

Construction of the project could kill or injure American Badgers by crushing individuals with heavy equipment or could entomb them within a den. Construction activities could

also result in disturbance or harassment of individuals. Condition of Certification **BIO-17** requires development of an American Badger and Kit Fox Management Plan that includes, but is not limited to, conducting pre-construction baseline surveys and expanded avoidance measures to protect badgers and Kit Foxes during construction and operation. (Ex. 2000, p. 4.2-144.)

The Desert Kit Fox is not a special-status species, but it is protected under Cal. Code Regs., title 14, section 460, and potential impacts to individuals of this species must be avoided. Desert Kit Fox sign was detected on the PSPP project site during surveys conducted in 2009 and 2010, and the site includes suitable foraging and denning habitat for this species. This species has been detected on the site as recently as spring 2013. (Ex. 2000, p. 4.2-145.)

In 2011, an outbreak of canine distemper virus (CDV) was identified in the Desert Kit Fox population within or adjacent to the Genesis Solar Energy Project (GSEP) project site located approximately 10 miles east of the PSEGS site. This disease had not been reported previously in wild Desert Kit Foxes. Additional CDV deaths were detected at the Colorado River substation approximately 11 miles south of the GSEP site in February 2012, and additional foxes shedding the virus were detected near both sites. To date, 22 Kit Fox carcasses submitted from the solar projects have been necropsied, and 11 of these deaths (50 percent) were due to distemper. The last known distemper death was detected in May 2012 near the Colorado River substation. It is thought that stress from animals being passively relocated or disturbed may put animals at greater risk of contracting the disease if conducted in an area experiencing or adjacent to a CDV outbreak, as CDV infection decreases immune function. In addition, passive relocation activities in an area experiencing a CDV outbreak may result in increased movement of animals shedding the virus and thereby increasing transmission into new areas. (Ex. 2000, p. 4.2-145.)

The CDFW Wildlife Investigations Laboratory has monitored, via telemetry and remote cameras, the survival of a sample ranging from 9-18 radio-collared foxes living in close proximity to each site and their dens at four study sites since late January 2012, in order to better detect cases of CDV. Consultants for the Desert Sunlight project, Colorado substation, and GSEP are monitoring survival of the collared foxes near their respective sites while the Palen site is monitored by a CDFW wildlife technician. No distemper-caused mortalities have been detected in monitored foxes near the PSEGS or Desert Sunlight sites located in the western portion of the Riverside East Solar Energy Zone (solar zone). However, testing of live foxes in 2012 and 2013 shows that some foxes in this area have been exposed to canine distemper virus as antibodies against the virus have been detected in their serum. Thus, it is likely that the canine distemper virus is also present in the western portion of the solar zone. (Ex. 2000, p. 4.2-145.)

In order to address the concern of increasing the risk of spreading canine distemper virus within the Palen Desert Kit Fox population, CDFW and the BLM coordinated with

Energy Commission Staff to develop a CDFW-led Proposed Desert Kit Fox Health Monitoring and Mitigation Program. The CDFW-led Proposed Desert Kit Fox Health Monitoring and Mitigation Program would be initiated by CDFW, potentially by the end of 2013, and project owners could opt to pay a fee to participate in the program. (Ex. 2000, p. 4.2-145.)

Construction of the PSEGS project could kill or injure Desert Kit Fox by crushing individuals with heavy equipment, or could entomb them within a den if avoidance measures are not implemented. Construction activities could also result in disturbance or harassment of individuals or introduction of foxes into populations with CDV, or increase risk of contracting the disease. Condition of Certification **BIO-17**, which replaces **BIO-17** from the PSPP Commission Decision in its entirety, requires development of an American Badger and Desert Kit Fox Mitigation and Monitoring Plan. The revised Condition of Certification **BIO-17**, which still requires development of an American Badger and Desert Kit Fox Mitigation and Monitoring Plan that includes, but is not limited to, procedures and impact avoidance measures for conducting pre-construction baseline surveys and avoidance measures to protect Kit Fox during construction and operation, would avoid this potential impact. (Ex. 2000, p. 4.2-146.)

The PSEGS will permanently remove approximately 3,899 acres of foraging and denning habitat for American Badgers and Kit Fox and will fragment and reduce the value of foraging and denning habitat adjacent to the project site. This habitat loss and degradation could adversely affect American Badger and Kit Fox populations within the NECO planning area. As discussed in the cumulative impact subsection, Staff considers the PSEGS project to be a substantial contributor to the cumulative loss of the NECO planning area Biological Resources, including American Badgers and Kit Fox. Conditions of Certification **BIO-12**, the Desert Tortoise Compensatory Mitigation Plan, and **BIO-21**, Compensatory Mitigation for State Waters, would offset the loss of habitat for this species and reduce the impact to less than significant. (Ex. 2000, p. 4.2-146.)

Reasonably anticipated cumulative effects include habitat fragmentation and the diminished habitat values of remaining habitat from increased noise, lighting, exotic plant invasions including their ability to fuel wildfires and alter fire regimes, exotic wildlife invasions, dust and air pollution, increase in predators, agriculture, urban development and the consequences of human intrusion into previously undisturbed habitats, hunting, use of rodenticides and other poisons, road kills, trapping, and human disturbance. (Ex. 2000, p. 4.2-206.)

At the evidentiary hearing, Intervenor CBD's expert raised concerns about impacts to the Kit Fox and concerns regarding the inadequacy of the mitigation and the need for further monitoring. Staff and a representative from CDFW responded to CBD's concerns by explaining that the jurisdiction of the Energy Commission did not extend beyond the mitigation imposed. CDFW is designing a Kit Fox monitoring program that would encompass the entire region rather than focusing on individual power plants. (10/29/13

RT 198:6 – 205:19.) Further, the impacts to the Kit Fox within the footprint of the project and the corresponding mitigation were fully adjudicated in the PSCP Decision; therefore, the issue falls beyond the scope of the amendment. (Public Resources Code, section 21166, CEQA Guidelines 15162 and 15163; see also *Black Property Owners Association v. City of Berkeley* (1994) 22 Cal.App.4th 974; *Benton v. Board of Supervisors* (1991) 226 Cal.App.1467; *Temecula Band of Luiseno Mission Indians v. Ranch California Water Dist.*(4<sup>th</sup> Dist. 1996) 43 Cal.App.4<sup>th</sup> 425.

American Badger and Desert Kit Fox habitat will be displaced by proposed future projects in the Chuckwalla Valley and NECO planning area. We find this effect cumulatively considerable when combined with the anticipated indirect effects to remaining habitat and populations described above. The PSEGS project's contribution to the loss of habitat, increased noise and lighting, road kills, fragmentation, and the spread of invasive pest plants is cumulatively considerable and would be consistent with the Commission's Decision for the PSCP. However, the evidence leads us to conclude that the project's contribution to these effects would be reduced to a level less than cumulatively considerable through several conditions of certification designed to address indirect effects as well as habitat loss. These include: **BIO-17**(Badger- and Kit Fox-Specific Avoidance and Minimization Measures); **BIO-8** (general avoidance and minimization measures), which contains specific measures to minimize noise and lighting impacts and provides mechanisms to monitor and control the spread of canine distemper; **BIO-14** (Weed Management Plan) to address the project's contribution to the spread of invasive plants that degrade habitat and fuel fires; **BIO-12** for acquisition of 4,860 acres of Desert Tortoise habitat that is expected to contain suitable habitat for badger and Kit Fox; and **BIO-21** that requires acquisition and protection of desert washes and adjacent habitat within the local watersheds, which will minimize future fragmentation in the Chuckwalla Valley area by protecting lands from future development. (Ex. 2000, p. 4.2-206.)

### **Burro Deer**

Burro Deer is a subspecies of Mule Deer (*Odocoileus hemionus*) found in the Colorado Desert of Southern California. This species is found in the Colorado region of the Sonoran Desert near the Colorado River and within desert dry wash woodland communities. Some Burro Deer are resident along the Colorado River, but a significant portion move into desert areas in response to water and forage. During the hot summers water is critical and burro deer concentrate along the Colorado River or the Coachella Canal where water developments have been installed and where microphyll woodland is dense and provides good forage and cover. With late summer thunder showers and cooler temperatures, deer move away from the Colorado River and Coachella Canal and then up the larger washes into the mountains or wash complexes in the foothills. (Ex. 2000, p. 4.2-71.)

During spring 2009 and December 2009 field surveys for the PSPP, deer scat and tracks were observed in rocky substrate and deep washes including the western, central, and eastern desert washes that transect the project site. Deer sign was found within the washes and 150-foot-wide box culverts that convey the washes underneath I-10. Burro Deer use the culvert associated with the western-most project area wash to access a water source at a nearby orchard. Other species sign observed in these washes include coyote, cottontail rabbit, bobcat, badger, and Kit Fox. During spring 2013 field surveys for the PSEGS, deer scat and tracks were observed in arboreal washes east of the modified generation tie-line, both adjacent to the I-10, and one set of deer tracks was also observed in the buffer for the natural-gas pipeline south of the I-10. The entire project site supports suitable habitat for Burro Deer. (Ex. 2000, pp. 4.2-71 – 4.2-72.)

The project's contribution to the loss of Burro Deer range is not cumulatively considerable and would be consistent with the Commission's Decision for the PSPP. However, the project will contribute to a cumulatively considerable loss of desert dry wash woodland (microphyll woodland) within the Palen watershed. (Ex. 2000, p. 4.2-72.)

With the implementation of Condition of Certification **BIO-21** that requires acquisition and enhancement of 788 acres of desert dry wash woodland to be mitigated within the same local watersheds as the site of the impact, the PSEGS project's contribution would be less than cumulatively considerable and would be consistent with the Commission's Decision for the PSPP. **BIO-21** will also minimize future fragmentation in the Chuckwalla Valley region by permanently protecting these critical resources from future development and its associated indirect effects. (Ex. 2000, p. 4.2-72.)

### **Nelson's Bighorn Sheep**

The PSEGS site is not within any of the bighorn sheep connectivity corridors identified in the NECO; in addition the NECO identifies I-10 as a barrier to bighorn sheep movement. Staff concluded that the project site is not currently an important movement corridor because of the presence of I-10 and the width of the valley between suitable bighorn sheep habitat. The Society for Conservation of Bighorn Sheep has recommended a one-mile buffer from the upper edge of any solar development to the base of the mountains to protect spring foraging habitat. The PSEGS site is over one mile from the base of either the Chuckwalla or Palen mountains. Barriers between the Chuckwalla Mountains and the project site (I-10) and the Palen Mountains and the project site (sand dunes) further restrict the availability and usefulness of the project site for spring foraging habitat. (Ex. 2000, pp. 4.2-146 – 4.2-147.)

There are also other potential impacts from project groundwater extraction to seeps, springs, or other water resources that are currently available to bighorn sheep that occupy the Palen Mountains. After reviewing the data provided in the data responses, Staff agreed with the PSPP applicant that the PSPP project was unlikely to affect

springs and seeps available for use by bighorn sheep. The PSEGS will not have any additional impacts on springs and seeps not already analyzed for the PSPP. (Ex. 2000, p. 4.2-147.)

As discussed in the cumulative impacts section, the PSEGS project will not directly affect habitat within any NECO connectivity corridors or WHMAs, and will not conflict with Desert Bighorn Sheep Conservation goals and objectives outlined in the NECO. We find that the project site does not represent significant direct or indirect impacts to bighorn sheep habitat connectivity or foraging. (Ex. 2000, p. 4.2-147.)

The approved PSPP project analysis of the NECO bighorn sheep WHMAs and connectivity corridors indicated that occupied and unoccupied ranges would be relatively unaffected by past and future projects (from habitat conversion), due largely to their position in wilderness areas and at higher elevations. However, large-scale renewable energy development could significantly impact gene flow between sheep populations through significant cumulative impacts to connectivity corridors, potentially decreasing the viability of the metapopulation of bighorn sheep. The project itself, however, would have no direct contribution to the loss of habitat within the identified connectivity corridors or WHMAs. (Ex. 2000, p. 4.2-201.)

Proposed future projects could also cumulatively and significantly affect bighorn sheep through the loss of spring foraging habitat on the upper bajadas adjacent to occupied range. The impact of development within a one-mile buffer from the base of occupied ranges (or potentially restored populations in unoccupied ranges) was assessed for potential impacts to bighorn sheep foraging habitat. No significant direct impacts to bighorn sheep WHMAs, connectivity corridors, or spring foraging habitat would result from the proposed project; therefore, no mitigation measures relating to bighorn sheep are necessary. We find that although the project will affect wildlife movement and connectivity with important wildlife areas north and south of I-10, the project will not significantly affect (directly, indirectly, or cumulatively) bighorn sheep movement. (Ex. 2000, p. 4.2-201.)

### **Construction Noise**

Construction activities will cause a temporary, although relatively long-term (34 months) increase in ambient noise level on the project site and in some adjacent habitat. Animals rely on hearing to avoid predators, obtain food, and communicate. Excessive construction noise could interfere with normal communication, potentially interfering with maintenance of contact between mated birds, obscuring warning and distress calls that signify predators and other threats, and affecting feeding behavior and protection of the young. High noise levels may also render an otherwise suitable nesting area unsuitable. Behavioral and physiological responses to noise and vibration have the potential to cause injury, energy loss (from movement away from noise source), a decrease in food intake, habitat avoidance and abandonment, and reproduction. (Ex. 2000, p. 4.2-147.)

Noise from operation of PSEGS and nighttime washing and maintenance activities of the heliostats could affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to avoid areas adjacent to the project. This could disrupt foraging, breeding, sheltering, and other activities. However, lighting and noise from washing would disrupt nocturnal animals in adjacent habitat and those that remain within the project fence line. Staff considers noise effects to be of a concern for wildlife located in and adjacent to the project site. (Ex. 2000, p. 4.2-147.)

The bighorn sheep WHMA, approximately 2.5 miles northeast of the PSEGS, is a sensitive noise receptor due to the presence of breeding Nelson's Bighorn Sheep. Birds are also expected to nest in creosote scrub and desert dry wash woodland on the project site and on adjacent lands that border the site. Studies have shown that noise levels over 60 A-weighted decibels (dBA) can result in nest abandonment by birds, and intense, long-lasting noise can mask bird calls, which can reduce reproductive success. Many bird species rely on vocalizations during the breeding season to attract a mate, and noise from construction or operation could disturb nesting birds and other wildlife. (Ex. 2000, pp. 4.2-147 – 4.2-148.)

Evidence suggests that noise levels will be similar to those described for the approved PSPP project. Assuming that construction noise is similar; the average construction noise of 85 dBA at 50 feet from the noise center and noise attenuation of 6 dBA per doubling of distance, normal construction noise would attenuate to about 60 dBA approximately 800 feet (0.15 mile) from the noise center. The majority of the construction activities would occur within the power blocks located approximately 3,750 feet (0.71 mile) from the project boundary. Therefore, the average construction noise levels would typically be less than 60 dBA in the bighorn sheep DWMA and surrounding the project site. On those infrequent occasions when construction activities would occur near the project boundary and resultant noise levels would be temporarily elevated beyond 60 dBA surrounding the project, it will not significantly impact sensitive wildlife that occur in habitat adjacent to the PSEGS fence line. Animals that remain within the fence line will be subject to potentially significant noise effects. (Ex. 2000, p. 4.2-148.)

Although average construction noise levels will usually attenuate to 60 dBA at the project boundary, unsilenced steam blows and pile driving produce short-term sporadic and loud noise that could substantially elevate noise levels in the bighorn sheep DWMA. The loudest proposed construction activity would be steam blows required to prepare a steam turbine for startup during the final phase before operation. This process cleans the piping and tubing that carry steam to the turbines; starting the turbines without cleaning these systems would destroy the turbine. High pressure steam blows require a series of short steam blows, lasting two or three minutes each, which would be performed several times daily over a period of two or three weeks. These steam blows can produce noise as loud as 130 dBA at a distance of 100 feet. This would attenuate to about 88 dBA at a distance of 2.5 miles from the project site, and 77 dBA at nine miles

from the project site. Silenced steam blows, however, are commonly reduced to 89 dBA at 50 feet, which would attenuate to less than 53 dBA at the project boundary. The PSPP project owner proposed to use a low-pressure technique for steam blows, which would release steam over a continuous period of about 36 hours and would result in noise levels of about 80 dBA at 100 feet and less than 50 dBA beyond the project boundary. Another relatively loud and short-term construction activity is pile driving. If required, noise from this activity could be expected to reach 101 dBA at a distance of 50 feet and attenuate to less than 59 dBA at a distance of 2.5 miles from the project site. (Ex. 2000, p. 4.2-148.)

Elevated noise from steam blows and pile driving could adversely affect the breeding, roosting, or foraging activities of sensitive wildlife near the project area. To minimize these potential noise impacts, Condition of Certification **BIO-8** requires avoidance of loud construction activities (i.e., steam blowing and pile driving) that would result in noise levels over 65 dBA at potential wildlife breeding sites (such as dry desert wash woodland) between February 15 and April 15 (the height of the bird breeding season). With implementation of this condition, impacts from project construction activities will be less than significant. Employing the low-pressure steam blow technique will further reduce noise levels and the potential for impacts to wildlife. For a complete analysis of construction noise impacts, refer to the **NOISE AND VIBRATION** section of this Decision. (Ex. 2000, p. 4.2-149.)

In order to efficiently produce and distribute concrete within the project site, the project owner will utilize a concrete batch plant for the PSEGS. The batch plant would have a similar impact as the concrete batch plant included as part of the project description for the PSPP. The PSPP would have had a concrete batch plant with a production capacity of 150 cubic yards per hour and would be expected to operate 10 hours per day, five days a week. Night operation of the batch plant would be required to overcome the difficulty of performing concrete placement in extremely high ambient temperatures. (Ex. 2000, p. 4.2-149.)

The batch plant would be portable and would be moveable to a number of different locations to support current work activities, but would occur entirely within the Project Disturbance Areas. The likely deployment locations for the produced concrete are the two power blocks and the project's main warehouse area. Batch plant noise levels would be approximately 90 decibels at 50 feet. Although noise levels would be slightly higher than the construction noise levels at the project site boundary, evidence indicates that noise levels from the concrete plant would attenuate over a greater distance since the plant will be located within the project boundaries. (Ex. 2000, p. 4.2-149.)

The Petition to Amend claims that construction noise from the PSEGS is expected to be the same as for the PSPP. Therefore, Staff testified that noise impacts from the concrete batch plant would be similar to those for the PSPP. Staff still believes that operation of the concrete plant at 90 decibels from the PSEGS project boundary could

have negative effects to nesting birds and other wildlife during their breeding seasons. Operation of the batch plant for a 10-hour period that spans into nighttime hours at intermittent levels of up to 90 decibels could alter breeding, foraging, and other behaviors of wildlife such as small burrowing mammals, bats, and nesting birds, especially nocturnal wildlife. With the implementation of site design measures and best management practices outlined in Condition of Certification **BIO-8** (Impact Avoidance and Minimization Measures), the impacts of additional, loud noise from the concrete batch plant to wildlife will be reduced to less-than-significant levels. (Ex. 2000, p. 4.2-149.)

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

### **State LORS**

Under the Warren-Alquist Act (Pub. Resources Code, § 25500), the Energy Commission's certificate for thermal power plants 50 MW and more is "in lieu of" other state, local, and regional permits. We have incorporated into the conditions of certification in this Decision all required terms and conditions that might otherwise be included in state permits to satisfy the following state LORS:

**Incidental Take Permit: California Endangered Species Act (CESA) (Fish and Game Code, sections 2050 et seq.).** The CESA prohibits the "take" (defined as "to hunt, pursue, catch, capture, or kill") of state-listed species except as otherwise provided in state law. Construction and operation of the PSEGS project could result in the take of Desert Tortoise, listed as threatened under CESA. Condition of Certification **BIO-12** specifies compensatory mitigation for Desert Tortoise habitat loss at a 5:1 ratio for all areas that occur within Critical Habitat and a 1:1 ratio for all other lands. Avoidance and minimization measures described in Conditions of Certification **BIO-6** through **BIO-11**, and **BIO-13** also mitigate for potential impacts to Desert Tortoise. Implementation of these conditions of certification will ensure compliance with CESA and ensure that impacts to Desert Tortoise are fully mitigated, with the exception of avian species. Take of any state listed threatened or endangered avian or bat species by collision, exposure to elevated flux, or loss of foraging habitat without a take permit would violate the CESA and is prohibited. (Ex. 2000, p. 4.2-218 – 4.2-219.)

**Streambed Alteration Agreement: California Fish and Game Code, sections 1600-1607.** Pursuant to these sections, CDFW typically regulates all changes to the natural flow, bed, or bank of any river, stream, or lake that supports fish or wildlife resources. Construction and operation of the project would result in direct impacts to at least 374.7 waters of the state. The project may also result in minor indirect impacts to approximately 32 acres of state waters located downstream of the site. Condition of Certification **BIO-21** minimizes and offsets direct and indirect impacts to state waters and assures compliance with CDFW codes that provide protection to these waters. (Ex. 2000, p. 4.2-219.)

**Protected Furbearing Mammals (Cal. Code Regs., title 14, section 460).** This regulation specifies that Fisher, Marten, River Otter, Desert Kit Fox, and Red Fox may not be taken at any time. Condition of Certification **BIO 17** (American Badger and Kit Fox Avoidance Measures) requires the development of a management plan to safely exclude animals from the project site and ensures compliance with the California Fish and Game Code, section 460, that provides protection to these species. (Ex. 2000, p. 4.2-219.)

**Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515).** These regulations designate certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also California Code of Regulations, title 14, section 670.7). Golden Eagles and Yuma Clapper Rails are a fully protected species that occur in the project area. Condition of Certification **BIO-15** (Pre-Construction Nesting Bird Surveys) will avoid direct take of these species during construction. This condition will not guarantee full protection of fully-protected species during project operations. Conditions of Certification **BIO-16a** and **BIO-16b** will require monitoring of the project site and impacts and implementation of a suite of recovery actions such as habitat enhancement, trash removal, power line retrofits, and other actions as determined to be beneficial across the range of species potentially impacted by construction and operation of the project. Loss of habitat would be off-set through Condition of Certification **BIO-12** (Compensation Lands for Loss of Sonoran Creosote Bush Scrub). Take of Golden Eagle and other listed fully-protected species, even if mitigated as required under CEQA, would violate the Fish and Game Code (Fully Protected Species Act) and is prohibited. (Ex. 2000, p. 4.2-219.)

**Nest or Eggs (Fish and Game Code, sections 3503, 3503.5, and 3513).** These regulations protect California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird and by providing a nexus to the Federal Migratory Bird Treaty Act. Implementation of Conditions of Certification **BIO-1** through **BIO-8** (Impact Avoidance and Best Management Practices) and **BIO-15** (Pre-construction Nest Surveys) would ensure the project complies with regulations that protect nesting birds and their nests. (Ex. 2000, p. 4.2-220.)

### **Federal LORS**

The project is located on federal land under the BLM's jurisdiction and is, therefore, subject to the provisions of the BLM's California Desert Conservation Area (CDCA) Plan. As an amendment to the CDCA Plan, the BLM produced the NECO. This document consists of proposed management actions and alternatives for public lands in the NECO planning area. The project is within the central portion of the NECO planning area. (Ex. 2000, p. 4.2-220.)

**Desert Wildlife Management Areas (DWMA).** DWMA's are general areas recommended by the Desert Tortoise Recovery Plan within which recovery efforts for the Desert Tortoise would be concentrated. DWMA's had no specific legal boundaries in

the 1994 Recovery Plan. The BLM formalized the general DWMA's from the 1994 Recovery Plan through its planning process and administers them as Areas of Critical Environmental Concern (see below). The project site is immediately north of the Chuckwalla DWMA, and approximately 1,400 linear feet of the proposed generation tie-line is located within the Chuckwalla DWMA. Construction in a DWMA is restricted to no more than one percent of the surface area. The proposed power plant and overhead transmission line require the BLM's approval of a right-of-way (ROW) grant and two CDCA Plan amendments; one amendment for the solar facility and one to allow the project's electric transmission line to be constructed outside a designated corridor. With the BLM's approval of the ROW grant and plan amendments, the PSEGS and the portion of the transmission line outside of the designated corridor would be consistent with the CDCA Plan. The project owner filed a revised plan of development with the BLM on February 13, 2013. The BLM requires increased mitigation ratios to offset habitat loss when constructing in a DWMA. Conditions of Certification **BIO-9** through **BIO-11** mitigate the loss of Desert Tortoise habitat and ensure that the PSEGS is compatible with the NECO area. Impacts to the DWMA will be mitigated at a 5:1 ratio. (Ex. 2000, p. 4.2-220.)

**Area of Critical Environmental Concern (ACEC).** The ACEC includes specific, legally- defined BLM designations where special management is needed to protect and prevent irreparable damage to important historical, cultural and scenic values, fish and wildlife, and natural resources, or to protect life and safety from natural hazards. The project is not included within any designated ACEC. (Ex. 2000, p. 4.2-220.)

**Critical Habitat** consists of specific areas, defined by the USFWS as areas essential for the conservation of the listed species, that support physical and biological features essential for survival and that may require special management considerations or protection. Critical habitat for the Desert Tortoise was designated in 1994, largely based on proposed DWMA's in the Draft Recovery Plan. The southwestern portion of the project site, natural-gas-line corridor, and proposed generation tie-line corridor overlaps with 228 acres of the Chuckwalla Desert Tortoise Critical Habitat Unit. Conditions of Certification **BIO-9** through **BIO-11** mitigate the loss of Desert Tortoise habitat and ensure that the PSEGS is compatible with the NECO area. Impacts to the Chuckwalla Desert Tortoise Critical Habitat Unit will be mitigated at a 5:1 ratio. (Ex. 2000, p. 4.2-221.)

**Wildlife Habitat Management Areas (WHMA's).** WHMA's address other special-status species and habitat management in the NECO planning area, and include two kinds: one for Bighorn Sheep and one for all other special status species and habitats. Bighorn Sheep WHMA's overlay the entire range of their occurrence and movement corridors. Multi-species WHMA's are complementary to existing restricted areas and DWMA's, which also cover other special status species and habitats. The entire PSEGS project is within a multi-species WHMA. Because PSEGS falls within a specially designated solar energy zone, no CDCA plan amendment is required. Typically the BLM requires

increased mitigation ratios to offset habitat loss when constructing in a DWMA. The proposed power plant and overhead transmission line require the BLM's approval of a ROW grant and two CDCA Plan amendments: one amendment for the solar facility and one to allow the project's electric transmission line to be constructed outside a designated corridor. With the BLM's approval of the ROW grant and plan amendments, the PSEGS and the portion of the transmission line outside of the designated corridor would be consistent with the CDCA Plan. The project owner filed a revised plan of development with the BLM on February 13, 2013. (Ex. 2000, p. 4.2-221.)

**Endangered Species Act (United States Code, tit. 16, section 1531 et seq.).** Potential take of the Desert Tortoise, listed as threatened by the USFWS, requires compliance with the federal Endangered Species Act (ESA). "Take" of a federally listed species is prohibited without an Incidental Take Permit, which would be obtained through a section 7 consultation between the BLM and the USFWS. The project owner has submitted a Revised Draft Biological Assessment (BA) for the project to the BLM. As of July 2013, the BLM submitted the BA to the USFWS and the formal section 7 consultation process has been reinitiated. The BA additionally included the Yuma Clapper Rail as a covered species. Take of any other federally threatened or endangered species would constitute a violation of ESA. (Ex. 2000, p. 4.2-221.)

**Federal Migratory Bird Act (U.S.C. §§ 703-712).** Adopted in 1918 to implement a treaty between the United States and Great Britain (on behalf of Canada), this federal law has been amended several times to add species, as well as covered areas, as the U.S. has entered into treaties with other nations (Russian Federation, Mexico, Japan).

The law makes it illegal for anyone to "take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations." The USFWS issues permits to qualified applicants for the following types of activities: falconry, raptor propagation, scientific collecting, special purposes (rehabilitation, educational, migratory game bird propagation, and salvage), take of depredating birds, taxidermy, and waterfowl sale and disposal. The migratory bird permit policy was developed by the Division of Migratory Bird Management and the permits themselves are issued by the Regional Bird Permit Offices. The regulations governing migratory bird permits can be found in 50 CFR, part 13 (General Permit Procedures) and 50 CFR, part 21 (Migratory Bird Permits). A complete listing of covered birds can be found at the following website:

<http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtintro.html>

**Bald and Golden Eagle Protection Act (United States Code, tit. 16, sections 668-668c).** A recently issued Final Rule (September 2009) provides for a regulatory mechanism under the Bald and Golden Eagle Protection Act (Eagle Act) to permit take of Bald or Golden Eagles comparable to incidental take permits under the ESA. This rule adds a new section at Code of Federal Regulations, title 50, section 22.26, to authorize the

issuance of permits to take Bald Eagles and Golden Eagles on a limited basis. The PSEGS project could potentially result in “take” of the Golden Eagle from disturbance to nesting pairs and loss of foraging habitat. Operation of the project could also result in injury or death of Bald and Golden Eagles that encounter concentrated solar flux over the heliostat field, potential collisions with project features such as power towers and heliostats, or electrocution via contact with power lines. While the risk of injury or death to Bald or Golden Eagles is unpredictable, there is the potential for take to occur over the 30-year life of the project. Implementation of Condition of Certification **BIO-16b** will avoid take of Golden Eagles by monitoring eagle nests during construction and implementing adaptive management measures, and **BIO-16a** will benefit Bald and Golden Eagles by requiring project monitoring and providing funds for various habitat conservation and enhancement measures that would benefit both Bald and Golden Eagles by improving habitat and lessening the risk of electrocution by contacting power lines. Conditions of Certification **BIO-12** and **BIO-21** provide suitable Bald and Golden Eagle foraging habitat by requiring the acquisition of Desert Tortoise habitat similar to that lost at the project site, as well as acquisition and permanent protection of desert dry wash habitat. While acquisition does not address the net loss of foraging habitat in the immediate future, it will prevent future losses of habitat by placing a permanent conservation easement and deed restrictions on private lands. The project owner has not elected to apply for an Eagle Conservation Permit at this time; take of an eagle would be considered a violation of the Bald and Golden Eagle Protection Act. (Ex. 2000, p. 4.2-221 – 4.2-222.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Applicant, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

The PSEGS project will eliminate the secondary emergency access road, reduce the project footprint from 4,366 acres to 3,794 acres, and reduce the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface. The PSEGS project and its alternatives will still result in significant impacts to sensitive biological resources and diminish the extent and value of native plant and animal communities in the region. The evidence indicates that the PSEGS project would

not provide any noteworthy public benefits related to Biological Resources, despite the contributions the project would make to meeting federal and state mandates for development of renewable energy resources. (Ex. 2000, p. 4.2-222).

## **PUBLIC COMMENT**

At the November 25, 2013 Evidentiary Hearing, **Tom Budlong** commented by telephone that given the data that is soon to come from Ivanpah (ISEGS), it would be irresponsible to proceed blindly with PSEGS without the benefit of learning from ISEGS. He also spoke to the collision risk from the “lake effect” of the heliostats. These issues are covered in the above **BIOLOGICAL RESOURCES** section of this Decision.

At the November 22, 2013 Evidentiary Hearing, **Wendy Campbell** commented by telephone that she opposed the project due to its “disastrous” effect on birds. Impacts to avian wildlife are covered in the above **BIOLOGICAL RESOURCES** section of this Decision.

**Seth Shteir** of the National Parks Conservation Association testified at the October 28, 2013 Evidentiary Hearing regarding his concern for avian resources at Joshua Tree National Park. He voiced concern about several local fully-protected avian species and queried that if avian impacts cannot be quantified, what guides good decision making? On January 2, 2014, he submitted another comment opposing the project due to immitigable significant impacts to avian species. These comments are covered in the above **BIOLOGICAL RESOURCES** section of this Decision.

**Joan Taylor**, chairman of the California-Nevada Desert Energy Committee for Sierra Club, commented at the October 29, 2013 Evidentiary Hearing. She expressed her concerns that large scale solar projects are proving to be attractive and deadly nuisances to the local wildlife and aerial species. She mentioned the incineration and damage to wing fibers, but observed that there is no way to quantify it. She recommended requiring studies at Ivanpah “prior to experimenting further with power towers.” These comments are covered in the above **BIOLOGICAL RESOURCES** section of this Decision.

**Paul Smith** provided comment on November 25, 2013. Among other topics, he raised concerns about direct and indirect adverse impacts to Desert Tortoises during construction, operation and decommissioning. Mr. Smith comments that USGS biologists believe that impacts from various factors (e.g., roads, off-site impacts, habitat fragmentation, noise effects, electromagnetic field generation, microclimate effects, pollutants from spills, dust suppressants and dust emissions during construction, water consumption by wet-cooled solar power plants, increased fire risks, light pollution, etc) on desert biological resources have been poorly studied. He observes that these types of solar facilities will kill large numbers of birds. The Migratory Bird Treaty prohibits this sort of killing, particularly in this important flyway. These concerns are all addressed above in the **BIOLOGICAL RESOURCES** section of this Decision, as well as in the **NOISE AND VIBRATION, TRAFFIC AND TRANSPORTATION, SOIL AND WATER**

**RESOURCES, AIR QUALITY, HAZARDOUS MATERIALS MANAGEMENT, VISUAL RESOURCES, and WORKER SAFETY AND FIRE PROTECTION** sections.

**Jody Fraser** from the USFWS provided comment on November 14, 2013, and concurred with Staff's conclusions regarding the PSEGS direct, indirect, and cumulative loss of habitat for desert-dependent species and avian species, including impacts from heliostats and solar flux. She recommends comprehensive third-party monitoring of bird and bat behavior at the site and in the vicinity per guidance from the REAT agencies. She notes that recent ISEGS avian data corroborates the 1986 McCrary study regarding adverse effects of solar flux on birds such as singeing, feather degradation, heat exhaustion, as well as the "lake effect" resulting in bird collisions and a cumulative avian "mortality sink" along I-10. She recommends that the Petition prepare an Eagle conservation plan and application to USFWS for an eagle incidental take permit. She also points out that ISEGS flux testing lead to considerable numbers of insect fatalities, including Monarch Butterflies and dragonflies. She comments that mass insect fatalities have adverse effects on the desert ecosystem and avifauna, and insect-dependent species along the insects' entire flight route. Ms. Fraser recommends elimination of the evaporation ponds and generally concurs with the requirements of Conditions of Certification **BIO-16a** and **16b**. On April 7, 2014, Jody Fraser commented that the Petitioner lacked sufficient new evidence to justify reopening the record. All of these comments are covered in the above **BIOLOGICAL RESOURCES** section of this Decision.

On November 14, 2013, **Sandy Choudari** commented that solar and wind power is the cleanest energy option with zero fuel cost. He believes the benefits outweigh costs. He comments that tortoises, lizards, and birds are adaptable and will make survival adjustments to environmental changes as they have for the past million years. He concludes that as long as the Petitioner provides enough land for mitigation needs, the PSEGS project should be approved. While we do not disagree about the great benefits of clean solar energy, the record contains substantial evidence that tortoises, lizards, and birds are not as adaptable as Mr. Choudari alleges. On May 6, 2014, and May 7, 2014, Mr. Choudari reiterated that the impacts to birds are not that important compared to the threat of global climate change. See the discussion in the above **BIOLOGICAL RESOURCES** section of this Decision.

**Brendan Hughes**, on November 13, 2013, expressed his concern with potential destruction and displacement of Desert Tortoises. He notes that surveys showed very few tortoises at Palen and Ivanpah sites, but actual experience at Ivanpah yielded many more. He recommends a complete survey for tortoises and other biological resources before proceeding further with project review. He also expressed concern about avian mortality at Ivanpah and the potential for similar impacts at the Palen site. He comments that bird deterrent methods should be proven before the PSEGS project moves forward. As we have pointed out several times in the above **BIOLOGICAL RESOURCES** section of this Decision, this is a petition to amend the approved PSPP project. Many of the

surveys for species occurring within the footprint of the PSEGS have been fully adjudicated and we have found that the record does not contain substantial evidence that would necessitate reopening previously adjudicated matters. We recognize that the record does not contain evidence of proven bird deterrent methods.

**Kim Delfino** of Defenders of Wildlife commented on December 20, 2013, that the PMPD erred in not concluding that impacts to the MFTL were not significant. She also believed that several species of birds would suffer adverse impacts. On May 6, 2014, she recommended against reopening the record due to the insufficiency of the Petitioner's evidence. On July 29, 2014, she submitted another comment urging the denial of the petition due to significant impacts to biological resources. These issues are covered in the above **BIOLOGICAL RESOURCES** section.

On October 29, 2013, Supervising Riverside County Counsel **Tiffany North** commented regarding her concern with tower technology's avian impacts and the failure of the Petitioner to identify mitigation land locations. These issues are covered in the above **BIOLOGICAL RESOURCES** section.

On January 8, 2014, **Sarah Friedman** of the Sierra Club commented that she approved of the PMPD finding of significant and unmitigable biological impacts of an unknown magnitude due to solar flux. On May 6, 2014, Sarah Friedman commented in support of the PMPD's denial of the project and opposed reopening the record. Again on July 29, 2014, Sarah Friedman submitted comments recommending denial of the petition, alleging that the impacts outweigh the benefits and citing a lack of data to inform the Decision.

On April 23, 2014, **Kenneth Waxlax** commented that the urgency of global climate change is such that it is more important to allow solar energy to be built now. Science funded by the solar developers will reduce bird deaths.

On May 5, 2014, **Garry George** of Audubon, California communicated his concern about the significant impact the PSEGS will have on avian life without appreciable benefit from this project compared to its alternatives. He supports denial of the project due to the unknown impacts to avian species. These comments were reiterated in comments July 31, 2014.

On May 7, 2014, **David Lamfrom** from the National Parks Conservation Association commented that he supported denying the petition to amend due to the insufficiency of the evidence and the reports about ISEGS that indicate a high level of avian mortality. On July 25, 2014, he submitted supplemental comments recommending denial of the petition due to impacts to birds and other impacts to Joshua Tree National Park.

On May 14, 2014, **Marian Fricano** expressed concern after reading a KCET article about solar farms killing hundreds of birds. She supports a denial of the project to help save birds.

On June 5, 2014, **Kurtis Engle** commented that the PSEGS solar flux would be a deathtrap for birds. He recommended using the photovoltaic alternative.

On June 23, 2014, **Grant Sizemore** of the American Bird Conservancy submitted a letter that he sent to the Department of Interior about feral cats. On July 21, 2014, he commented that neutering feral cats is not mitigation for avian mortality. Only feral cat removal would qualify as mitigation.

On July 21, 2014, **Kimbal Garrett**, Ornithology Collections Manager at the Natural History Museum of Los Angeles County, commented on three major concerns: (1) direct mortality impacts from solar flux and collisions with project infrastructure; (2) unsustainable use of water to allow the solar electric generating plant to operate; and (3) the likely ineffectiveness of proposed mitigation efforts. He recommends that mitigation dollars be applied directly to habitat preservation and restoration to the extent possible.

On July 24, 2014, **Bonnie Dierking** commented that the location within close proximity to Joshua Tree National Monument is a major concern and could pose a threat to this unique place. The documented threats to migratory birds as well as air travel are extremely valid concerns that need to be addressed. The desert is a diverse and fragile ecosystem that would take a lifetime or more to fully recover, if ever, once this technology is abandoned in the future in favor of something more efficient.

On July 28, 2014, **Shannon Eddy**, Executive Director of the Large-scale Solar Association, commented that he knows of no other industry or infrastructure project in California – transmission, mining, natural-gas power plants, or oil production sites to name a few – that is bound to avian mortality thresholds. With climate change recognized as the greatest threat to biological resources, now is not the time to impose thresholds on the solar industry, particularly given its contribution climate emission reductions. We urge the Committee to forgo implementing proposed mortality thresholds.

On July 30, 2014, **Shawn Gonzales** commented that the project almost certainly will attract, injure, and kill sensitive and migratory bird species. The solar power tower design likely has an extensive impact on flying insects based on anecdotal information from ISEGS surveys, although the extent of these impacts remains poorly understood.

On July 31, 2014, **Teresa Regina Weiner** commented that the current project has comparable terrestrial disturbance acreage to the PSPP, but intrudes more into the sand transport corridor and removes habitat for the MFTL, the Desert Kit Fox, the Burrowing Owl, and other terrestrial wildlife. The proposed power tower technology will create a vast area of concentrated solar heat/energy (flux), which will predictably incinerate or disable protected avian wildlife, including migratory birds, Golden Eagles and bats, not to mention invertebrates upon which birds and bats prey for sustenance. Thus, the new project has potential to harm vast numbers of birds in violation of federal

and state laws. Ms. Weiner also cited several failings of the BLM's SEIS and NEPA process.

On August 4, 2014, **Scott Connelly** urged denial of the project.

**Stacia Bailey, Neva Eddy, Manfred Scott, Ivy Ledesma, Joyce Dick, Jermaine Fisher, Daphne Hill-Poolaw, and Linda Otero** all stated that they were opposed to the project and expressed their deep traditional connections with the flora and fauna of the desert. **Cheryl Harper Escaria** described the connection of animals, plants, earth, water and mountains and made the point that you cannot put a price on nature. **Amanda Barrera** described traditional interactions between the tribal people and animal world. **Lorey Cachora** described how the birds and insects seek out light to educate themselves and he expressed his concern over the loss of species. **Arlene Kingery** explained how the desert is a rich universe for native people and also recommended better bird monitoring at ISEGS. These issues are covered in the above **BIOLOGICAL RESOURCES** and **CULTURAL RESOURCES** sections of this Decision.

## **FINDINGS OF FACT**

Based on the evidence, we find the following:

1. Construction and operation of PSEGS would disturb approximately 3,899 acres of previously undisturbed desert habitat.
2. The record identifies the plant and animal species found at the site and describes the special status species in detail.
3. Construction of the PSEGS project would result in direct and indirect impacts to numerous ephemeral streams and washes that occur within the Project Disturbance Area.
4. The evidence establishes that there are adequate riparian lands in the area to mitigate the impacts of the PSEGS project.
5. Implementation of Condition of Certification **BIO-21** reduces the PSEGS impacts to state waters to less-than-significant levels.
6. The effects of past, present, and foreseeable future projects combine with the project's effects and contribute to a significant cumulative impact on desert washes in the local watershed, particularly on the habitat functions and value of the washes.
7. The PSEGS project's contribution to the direct loss of desert washes in the Palen watershed and surrounding region would not be cumulatively considerable with implementation of Conditions of Certification **BIO-21, BIO-8** and **BIO-7**.
8. The tortoise fence for the PSEGS project would follow the same Approved Project Disturbance Area along I-10 as the PSPP.

9. PSEGS would not result in cumulatively considerable unmitigated impacts to connectivity for Desert Tortoise and other wildlife.
10. The project's contribution to cumulative impacts to wildlife movement and connectivity after mitigation is reduced to less-than-cumulatively-considerable levels. The direct and indirect impacts of the PSEGS on sand dunes and the processes that support them would significantly affect sand dune dependent species such as MFTLs, and could also impact Harwood's woollystar, Harwood's milkvetch, and sand dune dependent insect species.
11. The reliance on a threshold of 25 percent sand corridor blockage based upon Staff's model when it imposed Condition of Certification **BIO-20** is reasonable.
12. The significant direct and indirect impacts of PSEGS to sand dune habitat will be mitigated to less-than-significant levels with the purchase of compensation lands required by Condition of Certification **BIO-20**.
13. The PSEGS contribution to cumulatively considerable indirect effects from the spread of Sahara mustard and other invasive pest plants into dunes and the adjacent habitat's upslope will be minimized to a level less than cumulatively considerable through implementation of Conditions of Certification **BIO-14** (Weed Management Plan), **BIO-27** (Revegetation of Temporarily Disturbed Areas Using Locally Native Seed), **BIO-23** and **BIO-24** (Monitoring of Groundwater-Dependent Vegetation and Remedial Action In the Event of Adverse Effects).
14. The impacts PSEGS may have on cryptobiotic soils are mitigated below significance after implementation of the above-mentioned Conditions of Certification **BIO-8**, **BIO-12**, **BIO-19**, **BIO-20**, **BIO-22**, and **BIO-23**.
15. The PSEGS project would use less groundwater during both construction and operation than the originally approved PSPP project.
16. Construction and operation of the PSEGS project would not result in direct and indirect impacts to groundwater dependant biological resources.
17. With implementation of Conditions of Certification **BIO-23** and **BIO-24**, PSEGS impacts to biological resources dependent upon the Chuckwalla Valley groundwater basin would be less than cumulatively considerable.
18. Construction of the PSEGS project could directly and/or indirectly impact five special-status plant species: Harwood's woollystar, Harwood's milkvetch, Ribbed crypantha, California ditaxis, and Palen Lake saltbush.
19. Condition of Certification **BIO-12** (requiring acquisition of 4,860 acres of Desert Tortoise habitat in Chuckwalla Valley) and Condition of Certification **BIO-21** (requiring acquisition and protection of 788 acres of desert washes and desert dry wash woodland) minimize the project's contribution to the cumulative loss of these habitats to a level less than cumulatively considerable.

20. The project's potential indirect effects to nearby playa habitats would be minimized to a level less than cumulatively considerable through the implementation of **BIO-23** and **BIO-24**.
21. The PSEGS project would not result in direct impacts from construction or indirect impacts from hydrologic changes to downstream areas supporting Harwood's woollystar.
22. The project's direct impacts to Harwood's milkvetch are less than significant.
23. The project's contribution to cumulatively considerable impacts to all special-status plants, including Harwood's milkvetch in the project area, will be minimized to a level less than cumulatively considerable through implementation of **BIO-19**, (Avoidance & Minimization Measures for Special-status Plants), **BIO-14** (Weed Management Plan), **BIO-20** (Dune Compensation), and **BIO-21** (Compensation For Desert Washes).
24. The impacts of the PSEGS project to ribbed cryptantha, California ditaxis, Palen Lake saltbush and their habitat will be less than significant.
25. The PSEGS project's indirect impacts to sensitive plants would be significant absent mitigation.
26. Implementation of the following mitigation measures will reduce indirect project impacts to sensitive plants to less-than-significant levels: avoidance and minimization measures (**BIO-8**); compensating for habitat loss by preventing the future development of desert lands through acquisition and permanent protection under conservation easements, and management of these lands to sustain enhanced populations of sensitive species and habitats (**BIO-12**, **BIO-19**, **BIO-20**, and **BIO-22**); focusing the acquisitions into important linkages for species dispersal into critical refugia restoring degraded portions of acquired lands (**BIO-12** and **BIO-19**); and minimizing the size of the disturbance area along the linears (**BIO-8** and **BIO-19**).
27. Implementation of the following mitigation measures would reduce project impacts due to loss of carbon sequestration to less-than-significant levels: **BIO-8**, **BIO-12**, **BIO-19**, **BIO-20**, and **BIO-22**.
28. Implementation of the following mitigation renders any impacts to cacti, yucca or native trees insignificant: **BIO-8**, **BIO-14**, and **BIO-22**.
29. The mitigation contained in Conditions of Certification **BIO-9** through **BIO-12** reduces project impacts to Desert Tortoise to below the level of significance.
30. Implementation of measures in **BIO-13** will avoid or minimize the contributions of the project to increased Desert Tortoise predation from ravens to less-than-significant levels.

31. The potential increase in Desert Tortoise road fatalities is a significant impact of the project.
32. Condition of Certification **BIO-9** (Desert Tortoise Clearance Surveys and Exclusion Fencing) will reduce vehicular-related mortality impacts to less-than-significant levels.
33. Condition of Certification **BIO-14** (Weed Management Plan) includes monitoring and control measures that reduce impacts to Desert Tortoise from increases in Sahara mustard and other weeds to less-than-significant levels.
34. With implementation of Conditions of Certification **BIO-8**, **BIO-9**, and **BIO-12**, project impacts to Desert Tortoise connectivity are reduced to less-than-significant levels.
35. With implementation of Condition of Certification **BIO-12** (acquisition of Desert Tortoise compensation lands), the project's contribution to the cumulative loss of Desert Tortoise habitat will be reduced to a level less than cumulatively considerable.
36. The project would directly impact 1,480 acres of MFTL habitat in the northeastern portion of the Project Disturbance Area.
37. Implementation of existing **BIO-20** mitigates direct impacts to MFTL habitat to less-than-significant levels.
38. The PSEGS project's contribution to significant cumulative effects to MFTL is not cumulatively considerable after the implementation of Conditions of Certification **BIO-1** through **BIO-6**, **BIO-8**, **BIO-11**, **BIO-14**, and **BIO-20**.
39. The PSEGS project will not result in cumulatively considerable impacts to Couch's Spadefoot Toad.
40. Implementation of **BIO-16** will reduce potential impacts of the PSEGS project construction on nesting Golden Eagles to less-than-significant levels.
41. Without mitigation, the project's associated transmission lines contribute to a cumulatively considerable effect from collisions and electrocutions for Golden Eagles and other raptors.
42. The impact from collisions and electrocutions will be less than cumulatively considerable with implementation of Condition of Certification **BIO-8**.
43. Implementation of Conditions of Certification **BIO-16a** and **BIO-16b** further minimize the project's contribution to cumulatively considerable impacts from collisions, electrocutions, and habitat loss and degradation through the development of monitoring and an adaptive management program, power line retrofits, and annual funding for the life of the project for avian conservation

actions, including habitat enhancement and restoration to avoid, minimize, and mitigate future project-related avian impacts.

44. The project's contribution to cumulative effects to Golden Eagles from the operation of the PSEGS project may be cumulatively considerable even with the implementation of conditions of certification, based on the risk from exposure to elevated levels of solar flux.
45. With implementation of Conditions of Certification **BIO-18** (Burrowing Owl Impact Avoidance, Minimization and Compensation Measures) and **BIO-12** (land acquisition for Desert Tortoise), direct impacts to Burrowing Owls will be reduced to less-than-significant levels.
46. Indirect impacts to Burrowing Owl include collisions with project features, glare, electrocution, and exposure to elevated levels of solar flux.
47. Conditions of Certification **BIO-16a** and **BIO-16b** provide for ongoing project monitoring and implementation of a suite of habitat restoration and enhancement measures that would benefit Burrowing Owls, however potential indirect impacts may remain significant after mitigation.
48. The loss of habitat from all proposed future projects is significant and the project's contribution to that effect is cumulatively considerable.
49. The PSEGS project's contribution to indirect effects and loss of habitat will be mitigated to a level less than cumulatively considerable through: Conditions of Certification **BIO-8**, **BIO-12**, **BIO-14**, **BIO-18**, **BIO-21** and **BIO-27**.
50. The Energy Commission determined that cumulative effects to Burrowing Owl from construction of the PSPP would be mitigated to less-than-significant levels; however, the risk to Burrowing Owl from exposure to elevated levels of solar flux for the PSEGS may be cumulatively considerable even with the implementation of Conditions of Certification **BIO-16a** and **BIO-16b**.
51. The loss of avian habitat from the project would be significant absent mitigation.
52. Conditions of Certification **BIO-12**, the Desert Tortoise compensatory mitigation plan, **BIO-16a**, which would annually fund habitat enhancement and restoration, and **BIO-21**, mitigation for impacts to state waters, offset the project's contribution to cumulative loss of habitat for avian species below significance.
53. Mitigation measures that avoid and minimize impacts to nesting birds contained in Conditions of Certification **BIO-8** (Impact Avoidance and Minimization Measures); **BIO-15** (Pre-construction Nest Surveys); **BIO-16a** (Avian Enhancement and Conservation Plan); and **BIO-16b** (Avian and Bat Protection Plan) will avoid direct impacts to nests, eggs, or young of migratory birds and minimize the impacts to less-than-significant levels for construction disturbance to resident and migratory birds.

54. The amended PSEGS project will introduce several features that could result in mortality, morbidity, and reduced reproductive success in birds and in bats, and to insects.
55. With the Implementation of Condition of Certification **BIO-8**, the project transmission lines will not pose a significant electrocution threat to birds.
56. Condition of Certification **BIO-16a** will implement annual funding for avian and bat conservation efforts, effectively improving habitat for birds and bats.
57. The Avian and Bat Protection Plan and mortality monitoring required in Condition of Certification **BIO-16b** will effectively determine rates of bird and bat mortality from collisions with structures.
58. Residual impacts to avian species may exist after implementation of the conditions of certification.
59. Extended exposure to high-intensity solar flux will likely kill birds.
60. The record does not contain a reasonable estimate of avian mortality at PSEGS.
61. Condition of Certification **BIO-16a** is designed to compensate for death, injury/morbidity, and/or generally reduced reproductive success of individuals or a distinct population segment or segments of bird and bat species resulting from adverse contact with elevated levels of solar flux, mirror-related disorientation, and power tower collisions.
62. Conditions of Certification **BIO-16a** and **BIO-16b** attempt to mitigate for potential ongoing direct loss of individuals from project operation, including species that are fully protected under the California Fish and Game Code (Golden Eagle, Bald Eagle, American Peregrine Falcon, and Yuma Clapper Rail, among others).
63. Even if project impacts to Golden Eagle and other fully protected species can be mitigated to less than significant under CEQA, take of Golden Eagles or other fully protected species would violate the Fish and Game Code sections known as the Fully Protected Species Act (Cal. F & G Code, § 3511).
64. Feasible mitigation to reduce impacts to avian species from exposure to elevated levels of solar energy flux or irradiance to below the level of significance may not be possible.
65. The proposed mitigation in Conditions of Certification **BIO-16a** and **BIO-16b** may not reduce bird mortality below significance.
66. The Mitigation Contingency Fund is designed to provide additional mitigation funding to address significant issues that remain after implementation of all other mitigation in Conditions of Certification **BIO-16a**, **BIO-16b** and **BIO-16c**.

67. Condition of Certification **BIO-26** (installation of netting over the evaporation ponds to exclude birds, and monitoring) will reduce evaporation pond impacts to birds and other wildlife to less-than-significant levels.
68. The project's contribution to the cumulative loss of avian habitat will be mitigated to level less than cumulatively considerable through: avoidance and minimization measures in **BIO-8**, **BIO-14** (Weed Management Plan), and **BIO-27** (Revegetation of Temporarily Disturbed Soils); **BIO-12** (acquisition of 4,860 acres of Desert Tortoise habitat suitable for many resident and migratory birds) **BIO-15**, (pre-construction nesting bird surveys); **BIO-23** and **BIO-24** (monitoring for impacts to groundwater-dependent vegetation around Palen Dry Lake); and **BIO-21** (acquisition and protection of desert washes and adjacent habitat).
69. The Energy Commission determined that cumulative effects to most resident and migratory birds from construction of the PSPP would be mitigated to less-than-significant levels; however, the risk to these birds from exposure to elevated levels of solar flux from the PSEGS may be cumulatively considerable even with the implementation of Conditions of Certification **BIO-16a** and **BIO-16b**.
70. The amended PSEGS project will contribute incrementally to a cumulatively considerable loss, fragmentation, and degradation of habitat that could cause local extirpations and imperil Le Conte's Thrashers in the Mojave and Sonoran Deserts.
71. Conditions of Certification **BIO-1** through **BIO-8** effectively mitigate foraging habitat impacts for special-status bats to below the level of significance.
72. Conditions of Certification **BIO-12** and **BIO-21** will offset the cumulative loss of habitat for bat species.
73. Conditions of Certification **BIO-12** and **BIO-21** offset the loss of habitat for American Badgers and Kit Fox and reduce impacts to less than significant.
74. The project's contribution to cumulative impacts to American Badgers and Kit Fox will be reduced to a level less than cumulatively considerable through several conditions of certification, to wit, Conditions of Certification **BIO-17** (Badger and Kit Fox-Specific Avoidance and Minimization Measures); **BIO-8** (general avoidance and minimization measures which monitor and control the spread of canine distemper); **BIO-14** (Weed Management Plan); **BIO-12** (acquisition of 4,860 acres of Desert Tortoise habitat suitable habitat for badger and Kit Fox; and **BIO-21** (Acquisition and Protection of Desert Washes).
75. The project's contribution to the loss of Burro Deer range is not cumulatively considerable.
76. The project will not significantly affect (directly, indirectly, or cumulatively) the movement Nelson's Bighorn Sheep.

77. With the implementation of site design measures and best management practices outlined in Condition of Certification **BIO-8** (Impact Avoidance and Minimization Measures), the impacts of loud construction noise from the project to wildlife will be reduced to less-than-significant levels

78. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. The project owner will implement appropriate avoidance and mitigation measures to prevent significant adverse impacts to all sensitive species with the possible exception of resident and migratory birds.
2. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions of Certification below, as well as those in other portions of this Decision, the project will not result in significant direct, indirect, or cumulative impacts to biological resources except for a significant impact to avian species as mentioned above.
3. With implementation of the mitigation measures described in the evidentiary record and incorporated into the Conditions of Certification, the PSEGS will conform to all applicable LORS related to biological resources as identified above and in the pertinent portion of **Appendix A** of this Decision.
4. The change in the project would not add any benefit to the public, Applicant, and Intervenors relating to biological resources.
5. There has been a substantial change in circumstances since the original approval, because at the time of the original licensing, the project was wholly-owned by Solar Millenium. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

### **DESIGNATED BIOLOGIST SELECTION AND QUALIFICATIONS<sup>2</sup>**

**BIO-1** The project owner shall assign at least one Designated Biologist to the project. The project owner shall submit the resume of the proposed Designated Biologist(s), with at least three references and contact

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<sup>2</sup> USFWS <[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines/docs/dt](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines/docs/dt)> designates biologists who are approved to handle tortoises as "Authorized Biologists." Such biologists have demonstrated to the USFWS that they possess sufficient Desert Tortoise knowledge and experience to handle and move tortoises appropriately, and have received USFWS approval. Authorized Biologists are permitted to then approve specific monitors to handle tortoises, at their discretion. The California Department of Fish and Wildlife (CDFW) must also approve such biologists, potentially including individual approvals for monitors approved by the Authorized Biologist. **Designated Biologists are the equivalent of Authorized Biologists.** Only Designated Biologists and certain biological monitors who have been approved by the Designated Biologist would be allowed to handle Desert Tortoises

information, to the Energy Commission Compliance Project Manager (CPM) for approval in consultation with the BLM, USFWS, and CDFW.

The Designated Biologist must meet the following minimum qualifications:

1. Bachelor's degree in Biological Sciences, Zoology, Botany, Ecology, or a closely related field;
2. Three years of experience in Field Biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. Have at least one year of field experience with biological resources found in or near the project area;
4. Meet the current USFWS Authorized Biologist qualifications criteria ([www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)), demonstrate familiarity with protocols and guidelines for the Desert Tortoise, and be approved by the USFWS; and
5. Possess a California ESA Memorandum of Understanding pursuant to section 2081(a) for Desert Tortoise.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, in consultation with the BLM, USFWS, and CDFW that the proposed Designated Biologist or alternate has the appropriate training and background to effectively implement the Conditions of Certification.

**VERIFICATION:** At least 60 days prior to site mobilization or construction activities, the project owner shall submit the resumes of the Designated Biologist(s) along with the completed USFWS Desert Tortoise Authorized Biologist Request Form ([www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines)) and submit it to the USFWS and the CPM for review and final approval.

No site mobilization or construction-related ground disturbance shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

## **DESIGNATED BIOLOGIST DUTIES**

**BIO-2** The project owner shall ensure that the Designated Biologist performs the activities described below during any site mobilization and construction

commissioning, operation, non operation or closure, or other activities that may impact biological resources. The Designated Biologist may be assisted by the approved biological monitor(s) but remains the contact for the project owner and the CPM. The Designated Biologist's duties shall include the following:

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources conditions of certification;
2. Consult on the preparation of the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) to be submitted by the project owner;
3. Be available to supervise, conduct and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources such as special-status species or their habitat;
4. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
5. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (e.g., parking lots) for animals in harm's way;
6. Notify the project owner and the CPM of any non compliance with any biological resources condition of certification;
7. Respond directly to inquiries of the CPM regarding biological resources issues;
8. Determine and oversee implementation of remedial actions any time water has been observed standing on site in accordance with Condition of Certification **BIO-8**. The project owner shall initiate remedial methods in consultation with the Designated Biologist in accordance with Condition of Certification **BIO-8** after standing water has been observed on the project site. Remedial methods may include grading, pumping spraying, tilling, or any other means to disperse or ensure evaporation and/or absorption of standing water. Other remedial efforts may be determined in conjunction with CPM review and approval. Descriptions of remedial efforts, including photo

documentation and discussion of results of remedial efforts must be included in the (MCR);

9. Respond to reports of on-site Kit Fox mortality or injury, and to the extent possible, reports of dead or injured Kit Fox off site and immediately adjacent to the project boundaries or on access roads in accordance with Condition of Certification **BIO-17**, and undertake restorative and/or disease prevention actions as specified within the American Badger and Kit Fox Management Plan prepared in accordance with Condition of Certification **BIO-17**;
10. Maintain written records of the tasks specified above and those included in the BRMIMP. Summaries of these records shall be submitted in the MCR and the Annual Compliance Report;
11. Train the biological monitors as appropriate and ensure their familiarity with the BRMIMP, Worker Environmental Awareness Program (WEAP) training, and USFWS guidelines on Desert Tortoise surveys and handling procedures:  
[www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines); and
12. Maintain the ability to be in regular, direct communication with representatives of the BLM, USFWS, CDFW, and the CPM, including notifying these agencies of dead or injured listed species and reporting special-status species observations to the California Natural Diversity Database (CNDDDB).

**VERIFICATION:** The Designated Biologist shall provide copies of all written reports and summaries that document biological resources compliance activities in the MCRs submitted to the CPM. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report unless his or her duties cease as approved by the CPM.

### **BIOLOGICAL MONITOR SELECTION AND QUALIFICATIONS**

**BIO-3** The project owner's approved Designated Biologist shall submit a resume, at least three references, and contact information of the proposed biological monitors to the CPM. The resume shall demonstrate, to the satisfaction of the CPM, the appropriate education and experience to accomplish the assigned biological resources tasks. The biological monitor is the equivalent of the USFWS designated Desert Tortoise Monitor (USFWS 2008).

Biological monitor(s) training by the Designated Biologist shall include familiarity with the conditions of certification BRMIMP, WEAP, and

USFWS guidelines on Desert Tortoise surveys and handling procedures found at [www.fws.gov/ventura/speciesinfo/protocols\\_guidelines](http://www.fws.gov/ventura/speciesinfo/protocols_guidelines).

**VERIFICATION:** The project owner shall submit the specified information to the CPM for approval at least 45 days prior to the start of any site mobilization or construction activities. The Designated Biologist shall submit a written statement to the CPM confirming that individual biological monitor(s) has been trained including the date when training was completed. If additional biological monitors are needed during construction the specified information shall be submitted to the CPM for approval at least 10 days prior to their first day of monitoring activities.

#### **BIOLOGICAL MONITOR DUTIES**

**BIO-4** The biological monitors shall assist the Designated Biologist in conducting surveys, in monitoring of site mobilization and construction, including ground disturbance, site preparation, or permanent installation activities, including installation of Desert Tortoise exclusion fencing or reporting. The Designated Biologist shall remain the contact for the project owner and the CPM.

**VERIFICATION:** The Designated Biologist shall submit, in the MCR to the CPM, copies of all written reports and summaries that document biological resources compliance activities, including those conducted by biological monitors. If actions may affect biological resources during operation, a biological monitor, under the supervision of the Designated Biologist, shall be available for monitoring and reporting.

#### **DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY**

**BIO-5** The project owner's construction/operation manager shall act on the advice of the Designated Biologist and biological monitor(s) to ensure conformance with the biological resources conditions of certification. The project owner shall provide Energy Commission Staff with reasonable access to the project site under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The Designated Biologist shall have the authority to immediately stop any activity that is not in compliance with these conditions and/or order any reasonable measure to avoid take of an individual of a listed species. If required by the Designated Biologist and biological monitor(s), the project owner's construction/operation manager shall halt all site mobilization and construction, including ground disturbance, site preparation, or permanent installation activities, including installation of Desert Tortoise exclusion fencing, and operation activities in areas specified by the Designated Biologist. The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the construction/operation manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities and advise them of any corrective actions that have been taken or would be instituted as a result of the work stoppage. If the work stoppage relates to Desert Tortoise or any other federal- or state-listed species, the Palm Springs Office of the USFWS and the Ontario Office of the CDFW shall also be notified.

If the Designated Biologist is unavailable for direct consultation, the biological monitor shall act on behalf of the Designated Biologist. It is expected the Designated Biologist will be on site during construction or otherwise available by phone.

**VERIFICATION:** The project owner shall ensure that the Designated Biologist or biological monitor notifies the CPM and the BLM immediately (and no later than the morning following the incident, or Monday morning in the case of a weekend) of any non compliance or a halt of any site mobilization, ground disturbance, grading, construction, or operation activities. If the non compliance or halt to construction or operation relates to Desert Tortoise or any other federal- or state-listed species, the project owner shall also notify the Palm Springs Office of the USFWS and the Ontario Office of the CDFW at the same time. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure will be made by the CPM in consultation with the BLM, USFWS and CDFW within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

### **WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)**

**BIO-6** The project owner shall develop and implement a project-specific Worker Environmental Awareness Program (WEAP) and shall secure approval for the WEAP from the CPM. The project owner shall also provide the the BLM, USFWS, and CDFW a copy of all portions of the WEAP relating to Desert Tortoise and any other federal- or state-listed species for review and comment. The WEAP shall be administered to all on-site personnel including surveyors, construction engineers, employees, contractors, contractor's employees, supervisors, inspectors, subcontractors, and delivery personnel. The WEAP shall be implemented during site

mobilization and construction, commissioning, operation, non operation, and closure. The WEAP shall:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material and electronic media, including photographs of protected species and their habitat, is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas, and explain the reasons for protecting these resources; provide information to participants that no snakes or other wildlife shall be intentionally harmed (unless posing a reasonable and immediate threat to humans);
3. Place special emphasis on Desert Tortoise including pictures and information on physical characteristics, distribution, behavior, ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures;
4. Provide pictures of Golden Eagles, American Badger, Desert Kit Fox, MFTLs, and Burrowing Owl, and provide information on sensitivity to human activities, legal protection, reporting requirements, and how to identify construction avoidance zones for these species as marked by flagging, staking, or other means, and also describe the protections for bird nests and provide information as described above;
5. Provide overview for Staff of potential impacts to reptiles and amphibians from vehicle strikes on all project roads (paved and unpaved) during construction, operations, closure phases, reporting requirements, and protection measures;
6. Provide overview of potential impacts to avian species from concentrated solar flux created during start up and operations phase, reporting requirements, and protection measures;
7. Include a discussion of fire prevention measures to be implemented by workers during project activities and request workers to: a) dispose of cigarettes and cigars appropriately and not leave them on the ground or buried; b) keep vehicles on graveled or well-maintained roads at all times to prevent vehicle exhaust systems from coming in contact with roadside weeds; c) use and maintain approved spark arresters on all power equipment; and d) keep a fire extinguisher on hand at all times;
8. Describe the temporary and permanent habitat protection measures to be implemented at the project site;

9. Identify whom to contact if there are further comments and questions about the material discussed in the program; and
10. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist, and documented within the MCR.

**VERIFICATION:** At least 45 days prior to start of site mobilization and construction, the project owner shall provide to the CPM for review and approval and to the BLM, USFWS and CDFW, a copy of the final WEAP and all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the MCR the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date. At least 10 days prior to site mobilization and construction, the project owner shall submit two copies of the approved final WEAP and implement the training for all workers.

Training acknowledgement forms signed during construction shall be kept on file by the project owner for at least six months after the start of commercial operation.

Throughout the life of the project, the WEAP shall be repeated annually for permanent employees, and shall be routinely administered within one week of arrival to any new construction personnel, foremen, contractors, subcontractors, and other personnel potentially working within the project area. Upon completion of the orientation, employees shall sign a form stating that they attended the program and understand all protection measures. These forms shall be maintained by the project owner and shall be made available to the CPM, the BLM, USFWS and CDFW and upon request. Workers shall receive and be required to visibly display a hardhat sticker or certificate that they have completed the training.

During project operation, signed statements for operational personnel shall be kept on file for six months following the termination of an individual's employment.

## **BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION AND MONITORING PLAN**

**BIO-7** The project owner shall develop a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), and shall submit two copies of the proposed BRMIMP to the CPM and the BLM for review and approval and the BLM, USFWS, and CDFW for review. The project owner shall implement the measures identified in the approved BRMIMP. The BRMIMP shall incorporate avoidance and minimization measures described in final versions of the Desert Tortoise Translocation Plan, the

Raven Management Plan, the Closure, Conceptual Restoration Plan, the American Badger and Kit Fox Management Plan, the Burrowing Owl Mitigation and Monitoring Plan, the Weed Management Plan, and all other individual biological mitigation and/or monitoring plans associated with the project. The project owner shall provide to the BLM, USFWS, and CDFW a copy of all portions of the BRMIMP relating to Desert Tortoise and any other federal- or state-listed species for review and comment.

The BRMIMP shall be prepared in consultation with the Designated Biologist and shall include accurate and up-to-date maps depicting the location of sensitive biological resources that require temporary or permanent protection during construction and operation. The BRMIMP shall include complete and detailed descriptions of the following:

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources conditions of certification identified as necessary to avoid or mitigate impacts;
3. All biological resources mitigation, monitoring, and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion;
4. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation, and closure;
5. All required mitigation measures for each sensitive biological resources, including remedial actions for standing water on site in accordance with Condition of Certification **BIO-8**, and known or suspected disease outbreaks on the project site in accordance with Condition of Certification **BIO-17**;
6. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities; include one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Provide planned timing of aerial photography and a description of why times were chosen. Provide a final accounting of the before/after whole acreages and a determination of whether more or less habitat compensation is necessary in the Construction Termination Report prepared in accordance with **BIO-29**;
7. All measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;

8. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
9. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
10. All performance standards and remedial measures to be implemented if performance standards are not met;
11. Biological resources-related facility closure measures including a description of funding mechanism(s);
12. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval; and
13. A requirement to submit any sightings of any special-status species that are observed on or in proximity to the project site, or during project surveys, to the CNDDDB per CDFW, and the BLM requirements.

**VERIFICATION:** The project owner shall submit the draft BRMIMP to the CPM and the BLM at least 45 days prior to start of any site mobilization. At the same time the project owner shall provide to the BLM, USFWS, and CDFW ,a copy of all portions of the draft BRMIMP relating to Desert Tortoise and any other federal- or state-listed species. The project owner shall provide the final BRMIMP to the the BLM, USFWS, CDFW, and the CPM at least seven days prior to start of any site mobilization and construction. The BRMIMP shall contain all of the required measures included in all biological conditions of certification. No site mobilization or construction activities may occur prior to approval of the final BRMIMP by the CPM and the BLM.

If any permits have not yet been received when the final BRMIMP is submitted, these permits shall be submitted to the CPM within five days of their receipt, and the BRMIMP shall be revised or supplemented to reflect the permit condition(s). The project owner shall submit to the CPM and the BLM the revised or supplemented BRMIMP within 10 days following the project owner's receipt of any additional permits. Under no circumstances shall ground disturbance proceed without implementation of all permit conditions.

To verify that the extent of construction disturbance does not exceed that described in these conditions, the project owner shall submit aerial photographs, at an approved scale taken before and after construction, to the CPM, the BLM, USFWS, and CDFW. The first set of aerial photographs shall reflect site conditions prior to any site mobilization and construction activities and shall be submitted prior to initiation of such activities. The second set of aerial photographs shall be taken subsequent to completion of construction and shall be submitted to the CPM, the BLM, USFWS and CDFW no later than 90 days after completion of construction. The project owner shall also provide a final accounting in whole acres of vegetation communities/cover types

present before and after construction. Construction acreages shall be rounded to the nearest acre.

Any changes to the approved BRMIMP must be approved by the CPM and the BLM in consultation with CDFW and USFWS.

Implementation of BRMIMP measures (for example, construction activities that were monitored or species observed) shall be reported in the MCRs by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's site mobilization and construction activities, and which mitigation and monitoring items are still outstanding.

## **IMPACT AVOIDANCE AND MINIMIZATION MEASURES**

**BIO-8** The project owner shall undertake the following measures to manage the project site and related facilities during site mobilization, construction, operation, and maintenance in a manner to avoid or minimize impacts to biological resources:

1. Limit Disturbance Areas. Minimize soil disturbance by locating staging areas, laydowns, and temporary parking or storage for linears in existing disturbed areas. Equipment maintenance and refueling shall not be conducted within 100 feet of any sensitive resource (for example, waters of the state, desert dry wash woodland, dune habitats, and rare plant populations). Limit the width of the work area near sensitive resources. Avoid blading temporary access roads where feasible and instead drive over and crush the vegetation to preserve the seed bank and biotic soil crusts. The boundaries of all areas to be disturbed (including staging areas, access roads, and sites for temporary placement of spoils) shall be delineated with stakes and flagging prior to site mobilization and construction activities in consultation with the Designated Biologist. Spoils and topsoil shall be stockpiled in disturbed areas lacking native vegetation and which do not provide habitat for special-status species. Parking areas and staging and disposal site locations shall similarly be located in areas without native vegetation or special-status species habitat. All disturbances and project vehicles and equipment shall be confined to the flagged areas.
2. Minimize Road Impacts. New and existing roads that are planned for construction, widening, or other improvements shall not extend beyond the flagged impact area as described above. All vehicles passing or turning around would do so within the planned impact area or in previously disturbed areas. Where new access is required outside of

existing roads or the construction zone, the route shall be clearly marked (i.e., flagged and/or staked) prior to the onset of construction.

3. Minimize Traffic Impacts. Vehicular traffic during project site mobilization, construction, and operation shall be confined to existing routes of travel to and from the project site, and cross country vehicle and equipment use outside designated work areas shall be prohibited. The speed limit shall not exceed 25 miles per hour on paved or stabilized unpaved roads within the project area, on maintenance roads for linear facilities, or on access roads to the project site. No vehicle shall exceed 10 miles per hour on unpaved areas within the project site, except on stabilized unpaved roads. Project vehicles shall abide by posted speed limits on public paved access roads outside the project site. Additional speed limit signs shall be posted within areas where MFTLs are known to occur or have the potential to occur on site.
4. Monitor During Construction. In areas that have not been fenced with Desert Tortoise exclusion fencing and cleared, the Designated Biologist shall be present at the construction site during all project activities that have the potential to disturb soil, vegetation, and wildlife. Upon completion of Desert Tortoise fencing installation and clearing, the Designated Biologist or biological monitor shall be present at the construction site during all project activities that have the potential to disturb soil, vegetation, and wildlife. The Designated Biologist or biological monitor shall clear ahead of equipment during brushing and grading activities. If Desert Tortoises are found during construction monitoring, procedures outlined in **BIO-9** shall be implemented.
5. Salvage or Relocate Wildlife During Ground Disturbance Activities. The Designated Biologist or biological monitor shall salvage or relocate sensitive wildlife during ground disturbance activities including clearing, grubbing, and grading operations when feasible to off-site habitat or out of harm's way. The species shall be salvaged or relocated when conditions will not jeopardize the health and safety of the monitor.
6. Minimize Impacts of Transmission/Pipeline Alignments, Roads, and Staging Areas. Staging areas for construction on the plant site shall be within the area that has been fenced with Desert Tortoise exclusion fencing and cleared. For construction activities outside of the plant site (transmission line, pipeline alignments) access roads, pulling sites, and storage and parking areas shall be designed, installed, and maintained with the goal of minimizing impacts to native plant communities and sensitive biological resources. Transmission lines and all electrical

components shall be designed, installed, and maintained in accordance with the Avian Power Line Interaction Committee's (APLIC's) *Suggested Practices for Avian Protection on Power Lines* (APLIC 2006) and *Mitigating Bird Collisions with Power Lines* (APLIC 1994) to reduce the likelihood of large bird electrocutions and collisions. Where feasible, avoid impacts to desert washes and special-status plants by adjusting the locations of poles and lay-down areas, and the alignment of the roads and pipelines. Construction drawings and grading plans shall depict the locations of sensitive resources and demonstrate where temporary impacts to sensitive resources can be avoided and where they cannot.

7. Avoid Use of Toxic Substances. Soil bonding and weighting agents used on unpaved surfaces shall be non toxic to wildlife and plants.
8. Minimize Lighting Impacts. Facility lighting shall be designed, installed, and maintained to prevent side casting of light towards wildlife habitat.
9. Minimize Noise Impacts. A continuous low-pressure technique shall be used for steam blows to the extent possible in order to reduce noise levels in sensitive habitat proximate to the project site. Loud construction activities (e.g., unsilenced high-pressure steam blowing, pile driving, or other) shall be avoided from February 15th to April 15th when it would result in noise levels over 65 dBA in nesting habitat (excluding noise from passing vehicles). Loud construction activities may be permitted from February 15th to April 15th only if:
  - a. The Designated Biologist provides documentation (i.e., nesting bird data collected using methods described in **BIO-15** and maps depicting location of the nest survey area in relation to noisy construction) to the CPM indicating that no active nests would be subject to 65 dBA noise, or
  - b. The Designated Biologist or biological monitor monitors active nests within the range of construction-related noise exceeding 65 dBA. The monitoring shall be conducted in accordance with Nesting Bird Monitoring and Management Plan approved by the CPM. The plan shall include adaptive management measures to prevent disturbance to nesting birds from construction related noise. Triggers for adaptive management shall be evidence of project-related disturbance to nesting birds such as agitation behavior (displacement, avoidance, and defense), increased vigilance behavior at nest sites, changes in foraging and feeding behavior, or nest site abandonment. The Nesting Bird Monitoring and Management Plan shall include a description of adaptive

management actions, which shall include, but not be limited to, cessation of construction activities that are deemed by the Designated Biologist to be the source of disturbance to the nesting bird.

10. Avoid Vehicle Impacts to Desert Tortoise. Parking and storage shall occur within the area enclosed by Desert Tortoise exclusion fencing to the extent feasible. No vehicles or construction equipment parked outside the fenced area shall be moved prior to an inspection of the ground beneath the vehicle for the presence of Desert Tortoise. If a Desert Tortoise is observed outside the areas fenced with Desert Tortoise exclusion fencing it shall be left to move on its own. If it does not move within 15 minutes, a Designated Biologist or biological monitor, under the Designated Biologist's direct supervision, may move it out of harm's way as described in the USFWS Desert Tortoise Field Manual (USFWS 2009a).
11. Install Box Culvert. To provide for connectivity for Desert Tortoise and other wildlife, the project owner shall install a box culvert suitable for passage by Desert Tortoise and other wildlife under the Project Site Access Road. The box culvert shall be a concrete structure no less than four feet high and six feet wide with 3:1 side slopes and shall maintain a minimum of 18 inches of native material on the floor of the culvert at all times to facilitate tortoise movement.
12. Avoid Wildlife Pitfalls. To avoid trapping Desert Tortoise and other wildlife in trenches, pipes or culverts, the following measures shall be implemented:
  - a. Backfill Trenches. At the end of each work day, the Designated Biologist or biological monitor shall ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) outside the area fenced with Desert Tortoise exclusion fencing have been backfilled. If backfilling is not feasible, all trenches, bores, and other excavations shall be sloped at a 3:1 ratio at the ends to provide wildlife escape ramps, or covered completely to prevent wildlife access, or fully enclosed with Desert Tortoise exclusion fencing. All trenches, bores, and other excavations outside the areas permanently fenced with Desert Tortoise exclusion fencing shall be inspected periodically throughout the day, at the end of each workday, and at the beginning of each day by the Designated Biologist or a biological monitor. Should a tortoise or other wildlife become trapped, the Designated Biologist or biological monitor shall move the tortoise out of harm's way as described in the most

recent USFWS Desert Tortoise Field Manual (currently USFWS 2009a). Any wildlife encountered during the course of construction shall be allowed to leave the construction area unharmed.

- b. Avoid Entrapment of Desert Tortoise. Any construction pipe, culvert, or similar structure with a diameter greater than three inches stored less than eight inches above ground and within Desert Tortoise habitat (i.e., outside the permanently fenced area) for one or more nights, shall be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored outside the fenced area, or placed on elevated pipe racks. These materials would not need to be inspected or capped if they are stored within the permanently fenced area after the clearance surveys have been completed.
13. Minimize Standing Water. Water applied to dirt roads and construction areas (trenches or spoil piles) for dust abatement shall use the minimal amount needed to meet safety and air quality standards in an effort to prevent the formation of puddles, which could attract Desert Tortoises and common ravens to construction sites. A biological monitor shall patrol these areas to ensure water does not puddle and shall take appropriate action to reduce water application where necessary.
  14. Disposal of Road-killed Animals. Road killed animals or other carcasses detected by personnel on roads associated with the project area will be reported immediately to a biological monitor or Designated Biologist (or Project Environmental Compliance Monitor, during project operations), who will promptly remove the roadkill. For special-status species road kill, the biological monitor or Designated Biologist (or Project Environmental Compliance Monitor during project operations) shall contact the CPM, the BLM, USFWS, and CDFW within one working day of detection (within eight hours in the case of a desert Kit Fox) of the carcass for guidance on disposal or storage of the carcass; all other road kill shall be disposed of promptly. Handling of desert Kit Fox carcasses shall follow handling requirements included in the **BIO-18** American Badger and Kit Fox Management Plan. The biological monitor shall provide the special-status species record as described in **BIO-11** below.
  15. Minimize Spills of Hazardous Materials. All vehicles and equipment shall be maintained in proper working condition to minimize the potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The Designated Biologist shall

be informed of any hazardous spills immediately as directed in the Project Hazardous Materials Plan. Hazardous spills shall be immediately cleaned up and the contaminated soil properly disposed of at a licensed facility. Servicing of construction equipment shall take place only at a designated area. Service/maintenance vehicles shall carry a bucket and pads to absorb leaks or spills.

16. Worker Guidelines. During construction, all trash and food-related waste shall be placed in self-closing containers and removed daily from the site. Workers shall not feed wildlife or bring pets to the project site. Except for law enforcement personnel, no workers or visitors to the site shall bring firearms or weapons.
17. Avoid Spread of Noxious Weeds. The project owner shall implement the following BMP during construction and operation, and all other measures as required in the final approved Weed Management Plan (**BIO-14**) to prevent the spread and propagation of noxious weeds and other invasive plants:
  - a. For work outside the project facility fenceline, limit the size of any vegetation and/or ground disturbance and limit ingress and egress to defined routes;
  - b. Prevent spread of non-native plants via vehicular sources by implementing Trackclean™ or other methods of vehicle cleaning for vehicles coming and going from construction sites. Earth-moving equipment shall be cleaned prior to transport to the construction site; and
  - c. Use only weed-free straw, hay bales, and seed for erosion control and sediment barrier installations.
18. Implement Sediment Control Measures Near Desert Washes. Standard erosion control measures shall be implemented for all phases of construction and operation where sediment run-off from exposed slopes threatens to enter waters of the state. Sediment and other flow-restricting materials shall be moved to a location where they shall not be washed back into the stream. Areas of disturbed soils (access and staging areas) which slope toward drainages shall be stabilized to reduce erosion potential.
19. Monitor Ground Disturbing Activities Prior to Pre-Construction Site Mobilization. If pre-construction site mobilization requires ground-disturbing activities such as for geotechnical borings or hazardous waste evaluations, a Designated Biologist or biological monitor shall be

present to monitor any actions that could disturb soil, vegetation, or wildlife.

20. Implement Erosion Control Measures. All disturbed soils and roads within the project site shall be stabilized to reduce erosion potential both during and following construction. All areas subject to temporary disturbance shall be restored to pre-project grade and stabilized to prevent erosion and promote natural revegetation. Temporarily disturbed areas within the project area include, but are not limited to: linear facilities, temporary access roads, temporary lay-down and staging areas. If erosion control measures include the use of seed, only locally-native plant species from a local seed source shall be used. Local seed includes seeds from plants within the Chuckwalla Valley or Colorado River Hydrologic Units.
21. Avoid Spreading Weeds. Prior to the start of site mobilization and construction, flag and avoid dense populations of highly invasive noxious weeds. If these areas cannot be avoided, they shall be pre-treated by the methods described in **BIO-14** (Weed Management Plan). Noxious weeds and other invasive non-native plants in the temporarily disturbed areas shall be managed according to the requirements in **BIO-14**.
22. Salvage Topsoil. Topsoil from the project site shall be salvaged, preserved and re-used for restoration of temporarily disturbed areas. Salvaged topsoil shall be collected, stored and applied in a way that maintains the viability of seed and soil crusts. The project owner shall excavate and collect the upper soil layer (the top one to two inches that includes the seed bank and biotic soil crust), as well as the lower soil layer up to a depth of six to eight inches. The upper and lower soil layers shall be stockpiled separately in areas that will not be impacted by other grading, flooding, erosion, or pollutants. If the soil is to be stored more than two weeks, it shall be spread out to a depth of no more than six inches to maintain the seed and soil crust viability. The project owner shall install temporary construction fencing around stockpiled topsoil, and signage that indicates whether the pile is the upper layer seed bank, or the lower layer, and clearly indicates that the piles are for use only in erosion control. After construction, the project owner shall replace the topsoil in the temporarily disturbed areas in the reverse order of stockpiling, starting with the six-eight- inch layer of subsoil, and then the seed-containing upper layer, using a harrow or similar equipment to thinly distribute the layer to depths no greater than one to two inches.

23. Decommission Temporary Access Roads with Vertical Mulching.

Discourage ORV use of temporary construction roads by installing vertical mulching at the head of the road to a distance necessary to obscure the road from view. Boulder barricades and gates shall not be used unless the remainder of the site is fenced to prevent driving around the gate or barricade. Designated ORV routes and roads shall not be closed.

24. Vegetation Management Best Management Practices (BMP). All Mowing and Vegetation Management will follow the BMPs for Wildlife Habitat as defined by the BLM Handbook H-1601-1 or most current BLM guidance:

- a. Minimize direct impacts to species of concern through appropriate mitigation measures (e.g. season of activity, etc.). Avoid treatments during critical periods for wildlife (e.g. breeding, nesting, foaling, etc.).
- b. Consider habitat needs of bird populations (both migratory and non migratory). Avoid activities that may disrupt nesting and breeding of sensitive bird species.

**VERIFICATION:** All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the MCRs by the Designated Biologist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written construction termination report identifying how measures have been completed. As part of the Annual Compliance Report, each year following construction, the Designated Biologist shall provide a report to the CPM that describes compliance with avoidance and minimization measures to be implemented during operation (for example, a summary of the incidence of road-killed animals during the year, implementation of measures to avoid toxic spills, erosion and sedimentation, and efforts to enforce worker guidelines, etc.).

No less than 30 days prior to site mobilization and construction, the project owner shall provide the CPM, the BLM, USFWS, and CDFW with plans showing the design of a culvert under the Project Site Access Road that would provide access for Desert Tortoise and other wildlife. No less than 30 days after of completion of construction of the project site access road, the project owner shall provide as-built drawings of the culvert.

If loud construction activities are proposed between February 15<sup>th</sup> to April 15<sup>th</sup> that would result in noise levels over 65 dBA in nesting habitat, the project owner shall submit nest survey results (as described in 8a) to the CPM no more than seven days before initiating such construction. If an active nest is detected within this survey area, the project owner shall submit a Nesting Bird Monitoring and Management Plan to the

CPM for review and approval no more than seven days before initiating noisy construction.

## **DESERT TORTOISE CLEARANCE SURVEYS AND FENCING**

**BIO-9** The project owner shall undertake appropriate measures to manage the project site and related facilities in a manner to avoid or minimize impacts to Desert Tortoise. Methods for clearance surveys, fence specification and installation, tortoise handling, artificial burrow construction, egg handling, and other procedures shall be consistent with those described in the most recent USFWS Desert Tortoise Field Manual (currently USFWS 2009a)

<http://www.fws.gov/ventura/speciesinfo/protocols> guidelines

The project owner shall also implement all terms and conditions described in the Biological Opinion prepared by USFWS. The project owner shall implement the following measures:

1. Desert Tortoise Fencing Along I-10. To avoid increases in vehicular-related mortality from disruption of local movement patterns along the existing ephemeral wash systems, permanent Desert Tortoise-proof fencing shall be installed along the existing freeway right-of-way fencing on both sides of I-10 between the wash on the western-most end of the PSEGS site and the eastern-most wash associated with the PSEGS site (labeled as #10 and #13 in Wildlife Movement and Desert Tortoise Habitat [tn56755], AECOM 2010f). The project owner shall secure approval from California Department of Transportation (Caltrans) for the installation and maintenance of Desert Tortoise exclusion fencing prior to construction or repair. The tortoise fencing shall be designed to direct tortoises to an existing undercrossing to provide safe passage under the freeway, and shall be inspected per 2.d. and maintained for the life of the project.
2. Desert Tortoise Exclusion Fence Installation. To avoid impacts to Desert Tortoises, permanent exclusion fencing shall be installed along the permanent perimeter security fence (boundaries) as they are constructed. Temporary fencing shall be installed along any subset of the plant site phasing that does not correspond to permanent perimeter fencing. Temporary fencing shall be installed along linear features unless a biological monitor is present in the immediate vicinity of construction activities for the linear facility. All proposed alignments for permanent or temporary Desert Tortoise fencing shall be flagged and surveyed within 24 hours prior to the initiation of fence construction. Clearance surveys of the Desert Tortoise exclusionary fence and utility rights-of-way alignments shall be conducted by the Designated Biologist(s) using techniques outlined in the most recent USFWS

Desert Tortoise Field Manual (currently USFWS 2009a), and may be conducted in any season with USFWS and CDFW approval. Biological monitors may assist the Designated Biologist under his or her supervision. These fence clearance surveys shall provide 100 percent coverage of all areas to be disturbed and an additional transect along both sides of the fence line. Disturbance associated with Desert Tortoise exclusionary fence construction shall not exceed 30 feet on either side of the proposed fence alignment. Prior to the surveys, the project owner shall provide to the CPM, CDFW, and USFWS a figure clearly depicting the limits of construction disturbance for the proposed fence installation. The fence line survey area shall be 90 feet wide centered on the fence alignment. Where construction disturbance for fence line installation can be limited to 15 feet on either side of the fence line, this fence line survey area may be reduced to an area approximately 60 feet wide centered on the fence alignment. Transects shall be no greater than 15 feet apart. For the I-10 Desert Tortoise exclusion fence, the project owner may have a Designated Biologist present to clear ahead of fence construction and be present in the immediate vicinity of fence installation activities. Desert tortoise located within the utility ROW alignments shall be moved out of harm's way in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009a), or more recent guidance approved by the CPM. Any Desert Tortoise detected during clearance surveys for fencing within the plant site and along the perimeter fence alignment shall be translocated and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan (**BIO-10**). Tortoise shall be handled by the Designated Biologist(s) in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009).

- a. Timing and Supervision of Fence Installation. The exclusion fencing shall be installed in any area subject to disturbance prior to the onset of site clearing and grubbing in that area. The fence installation shall be supervised by the Designated Biologist and monitored by the biological monitors to ensure the safety of any tortoise present.
- b. Fence Material and Installation. All Desert Tortoise exclusionary fencing shall be constructed in accordance with the most recent USFWS Desert Tortoise Field Manual (currently USFWS 2009) (Chapter 8 – Desert Tortoise Exclusion Fence).
- c. Security Gates. Security gates shall be designed with minimal ground clearance to deter ingress by tortoises. The gates may be electronically activated to open and close immediately after the

vehicle(s) have entered or exited to prevent the gates from being kept open for long periods of time.

- d. Fence Inspections. Following installation of the Desert Tortoise exclusion fencing for both the permanent and temporary fencing, the fencing shall be regularly inspected. If tortoise were moved out of harm's way during fence construction, permanent and temporary fencing shall be inspected at least two times a day for the first seven days to ensure a recently-moved tortoise has not been trapped within the fence. Thereafter, permanent fencing shall be inspected monthly and within 24 hours following all major rainfall events or after notification of an accident. A major rainfall event is defined as one for which flow is detectable within the fenced drainage. Any damage to the fencing shall be temporarily repaired immediately to keep tortoises out of the site, and permanently repaired within 48 hours of observing damage. Repairs on I-10 fencing shall occur after any required authorization from Caltrans for work within their right-of-way. Inspections of permanent site fencing shall occur for the life of the project. Temporary fencing shall be inspected weekly and, where drainages intersect the fencing, during and within 24 hours following major rainfall events. All temporary fencing shall be repaired immediately upon discovery and, if the fence may have permitted tortoise entry while damaged, the Designated Biologist shall inspect the area for tortoise.
3. Desert Tortoise Clearance Surveys within the Plant Site. Clearance surveys shall be conducted in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009) (Chapter 6 – Clearance Survey Protocol for the Desert Tortoise – Mojave Population) or the most recent USFWS Desert Tortoise Field Manual (currently USFWS 2009a) and shall consist of two surveys covering 100 percent of the project area by walking transects no more than 15 feet apart. If a Desert Tortoise is located on the second survey, a third survey shall be conducted. To maximize the opportunity to find all tortoises, each separate survey shall be walked in a different direction, in opposite directions, and/or off set to allow opposing angles of observation, or as directed in the Biological Opinion. Clearance surveys of the plant site may only be conducted when tortoises are most active (April through May, or September through October) unless the project receives approval from CDFW and USFWS. Clearance surveys of linear features may be conducted during anytime of the year. Any tortoise located during clearance surveys of the power plant site and linear features shall be translocated or relocated and monitored in

accordance with the Desert Tortoise Relocation/Translocation Plan (Plan) below:

- a. Burrow Searches. During clearance surveys, all Desert Tortoise burrows, and burrows constructed by other species that might be used by Desert Tortoises, shall be examined by the Designated Biologist, who may be assisted by the biological monitors, to assess occupancy of each burrow by Desert Tortoises and handled in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009a). To prevent re-entry by a tortoise or other wildlife, all burrows shall be collapsed once absence has been determined in accordance with the Desert Tortoise Relocation/Translocation Plan. Tortoises taken from burrows and from elsewhere on the power plant site shall be relocated or translocated as described in the Desert Tortoise Relocation/ Translocation Plan.
  - b. Burrow Excavation/Handling. All potential Desert Tortoise burrows located during clearance surveys would be excavated by hand, tortoises removed, and collapsed or blocked to prevent occupation by Desert Tortoises in accordance with the Desert Tortoise Relocation/Translocation Plan. All Desert Tortoise handling and removal and burrow excavations, including nests, would be conducted by the Designated Biologist, who may be assisted by a biological monitor in accordance with the USFWS Desert Tortoise Field Manual (USFWS 2009) or more recent guidance approved by the CPM.
4. Monitoring Following Clearing. Following the Desert Tortoise clearance and removal from the power plant site and utility corridors, workers and heavy equipment shall be allowed to enter the project site to perform clearing, grubbing, leveling, and trenching activities. A Designated Biologist or biological monitor shall be on site for clearing and grading activities to move tortoises missed during the initial tortoise clearance survey. Should a tortoise be discovered, it shall be relocated or translocated as described in the Desert Tortoise Relocation/ Translocation Plan.
  5. Reporting. The Designated Biologist shall record the following information for any Desert Tortoises handled: a) the locations (narrative and maps) and dates of observation; b) general condition and health, including injuries, state of healing, and whether Desert Tortoise voided their bladders; c) location moved from and location moved to (using GPS technology); d) gender, carapace length, and diagnostic markings (i.e., identification numbers or marked lateral

scutes); e) ambient temperature when handled and released; and f) digital photograph of each handled Desert Tortoise. Desert Tortoise moved from within project areas shall be marked and monitored in accordance with the Desert Tortoise Relocation/Translocation Plan.

**VERIFICATION:** All mitigation measures and their implementation methods shall be included in the BRMIMP and implemented. Implementation of the measures shall be reported in the MCRs by the Designated Biologist. Within 30 days after completion of Desert Tortoise clearance surveys the Designated Biologist shall submit a report to the BLM, the CPM, USFWS, and CDFW describing implementation of each of the mitigation measures listed above. The report shall include the Desert Tortoise survey results, capture and release locations of any relocated Desert Tortoises, and any other information needed to demonstrate compliance with the measures described above.

Within six months of completion of Desert Tortoise exclusion fencing, I-10 Desert Tortoise exclusion fencing shall be installed. Within three months of completion of I-10 Desert Tortoise exclusion fence construction, the project owner shall provide the CPM, the BLM, USFWS, and CDFW with maps, as well as photographic documentation, showing the design and location of the fencing on both sides of I-10 south of the project site.

The project owner shall provide evidence of approval from Caltrans for installation of Desert Tortoise fencing along I-10 within their right-of-way at least 30 days prior to construction of the fencing.

## **DESERT TORTOISE RELOCATION/TRANSLOCATION PLAN (PLAN)**

**BIO-10** The project owner shall develop and implement a final Plan that is consistent with current USFWS approved guidelines, and meets the approval of the CPM. The Plan shall include measures to minimize the potential for repeated translocations of individual Desert Tortoises. The goals of the Plan shall be to relocate/translocate all Desert Tortoises from the project site to nearby suitable habitat, minimize impacts on resident Desert Tortoises outside the project site, minimize stress, disturbance, and injuries to relocated/translocated tortoises, and assess the success of the translocation effort through monitoring.. The revised draft Plan shall be based on the draft Plan prepared by the prior project owner (AECOM 2010a, **DR-BIO-55**) and shall include all revisions deemed necessary by the BLM, USFWS, CDFW, and the Energy Commission Staff.

**VERIFICATION:** At least 60 days prior to site mobilization and construction, the project owner shall provide the CPM with a revised draft of a Plan to the CPM for review and approval in consultation with the BLM, USFWS, and CDFW. At least 30 days prior to site mobilization and construction, the project owner shall provide the CPM with the final version of a Plan that has been reviewed and approved by the CPM in consultation with

the BLM, USFWS, and CDFW. All modifications to the approved Plan shall be made only after approval by the CPM in consultation with the BLM, USFWS, and CDFW.

Within 30 days after initiation of relocation and/or translocation activities, the Designated Biologist shall provide to the CPM, for review and approval, a written report identifying which items of the Plan have been completed, and a summary of all modifications to measures made during implementation of the Plan.

## **DESERT TORTOISE COMPLIANCE VERIFICATION**

**BIO-11** The project owner shall provide Energy Commission, the BLM, CDFW, and USFWS staff with reasonable access to the project site and compensation lands under the control of the project owner and shall otherwise fully cooperate with the Energy Commission's and the BLM's efforts to verify the project owner's compliance with, or the effectiveness of, mitigation measures set forth in the conditions of certification. The Designated Biologist shall do all of the following:

1. Notification. Notify the CPM at least 14 calendar days before initiating site mobilization and construction activities, immediately notify the CPM in writing if the project owner is not in compliance with any conditions of certification, including, but not limited to, any actual or anticipated failure to implement mitigation measures within the time periods specified in the conditions of certification;
2. Monitoring During Grubbing and Grading. Remain on site daily while vegetation salvage, grubbing, grading and other ground-disturbance construction activities are taking place to avoid or minimize take of listed species, and verify personally or use biological monitors to check for compliance with all impact avoidance and minimization measures, including checking all exclusion zones to ensure that signs, stakes, and fencing are intact and that human activities are restricted in these protective zones.
3. Monthly Compliance Inspections. Conduct compliance inspections at a minimum of once per month after ground disturbance activities including clearing, grubbing, and grading are completed and submit a MCR to the CPM, the BLM, USFWS, and CDFW during construction.
4. Notification of Injured or Dead Listed Species. If an injured or dead listed species is detected within or near the Project Disturbance Area, the CPM, the BLM, the Ontario Office of CDFW, and the Palm Springs Office of USFWS shall be notified immediately by phone and email. Notification shall occur no later than noon on the business day following the event if it occurs outside normal business hours so that the agencies can determine if further actions are required to protect

listed species (within eight hours in the case of desert Kit Fox). Written follow-up notification via FAX or electronic communication shall be submitted to these agencies within two calendar days of the incident and include the following information as relevant:

- a. Injured Desert Tortoise. If a Desert Tortoise is injured as a result of project-related activities during construction, the Designated Biologist or approved biological monitor shall immediately take it to a CDFW-approved wildlife rehabilitation and/or veterinarian clinic. Any veterinarian bills for such injured animals shall be paid by the project owner. Following phone notification as required above, the CPM, CDFW, and USFWS shall determine the final disposition of the injured animal, if it recovers. Written notification shall include, at a minimum, the date, time, and location, circumstances of the incident, and the name of the facility where the animal was taken.
  - b. Desert Tortoise Fatality. If a Desert Tortoise is killed by project-related activities during construction or operation, a written report with the same information as an injury report shall be submitted to the CPM, the BLM, the Ontario Office of CDFW, and the Palm Springs Office of USFWS. These Desert Tortoises shall be salvaged according to guidelines described in *Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoise* (Berry 2001) or most recent guidelines approved by the CPM. The project owner shall pay to have the Desert Tortoises transported and necropsied. The report shall include the date and time of the finding or incident.
5. Final Listed Species Report. The Designated Biologist shall provide the CPM and the BLM a Final Listed Species Mitigation Report that includes, at a minimum: 1) a copy of the table in the BRMIMP with notes showing when each of the mitigation measures was implemented; 2) all available information about project-related incidental take of listed species; 3) information about other project impacts on the listed species; 4) construction dates; 5) an assessment of the effectiveness of conditions of certification in minimizing and compensating for project impacts; 6) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the listed species; and 7) any other pertinent information, including the level of take of the listed species associated with the project.
  6. Stop Work Order. The CPM may issue the project owner a written stop work order to suspend any activity related to the construction or

operation of the project to prevent or remedy a violation of one or more conditions of certification (including, but not limited to, failure to comply with reporting, monitoring, or habitat acquisition obligations) or to prevent the illegal take of an endangered, threatened, or candidate species. The project owner shall comply with the stop work order immediately upon receipt thereof.

**VERIFICATION:** No later than two days following the above required notification of a sighting, injury, kill, or relocation of a listed species, the project owner shall deliver to the CPM, the BLM, CDFW, and USFWS, via FAX or electronic communication, the written report from the Designated Biologist describing all reported incidents of injury, kill, or relocation of a listed species, identifying who was notified and explaining when the incidents occurred. In the case of a sighting in an active construction area, the project owner shall, at the same time, submit a map (e.g., using Geographic Information Systems) depicting both the limits of construction and sighting location to the CPM, the BLM, CDFW, and USFWS.

No later than 45 days after initiation of project operation, the Designated Biologist shall provide the CPM and the BLM a Final Listed Species Mitigation Report.

Beginning with the first month after clearing, grubbing, and grading are completed and continuing every month until construction is complete, the project owner shall submit a report describing the results of Monthly Compliance Inspections to the CPM, the BLM, USFWS, and CDFW.

## **DESERT TORTOISE COMPENSATORY MITIGATION**

**BIO-12** To fully mitigate for habitat loss and potential take of Desert Tortoise, the project owner shall provide compensatory mitigation per **BIO-29 Table - 2**, adjusted to reflect the final project footprint. For purposes of this condition, the project footprint means all lands disturbed in the construction and operation of the Palen project, including all project linears, as well as undeveloped areas inside the project's boundaries that will no longer provide viable long-term habitat for the Desert Tortoise. To satisfy this condition, the project owner shall acquire, protect and transfer five acres of Desert Tortoise habitat for every acre of habitat within critical habitat and within the final project footprint, and one acre of Desert Tortoise habitat for every acre of habitat outside of critical habitat but within the final project footprint, and provide associated funding for the acquired lands, as specified below. Condition of Certification **BIO-28** may provide the project owner with one means for satisfying some or all of the requirements in this condition. In lieu of acquiring lands itself, the project owner may satisfy the requirements of this condition by depositing funds into the Renewable Energy Action Team (REAT) or with another CPM-approved entity, as provided below in section 3.i. of this condition.

The timing of the mitigation shall correspond with the timing of the site disturbance activities as stated in **BIO-29** . If compensation lands are acquired in fee title or in easement, the requirements for acquisition, initial improvement, and long-term management of compensation lands include all of the following:

1. Selection Criteria for Compensation Lands. The compensation lands selected for acquisition in fee title or in easement shall:
  - a. Be within the Colorado Desert Recovery Unit, with potential to contribute to Desert Tortoise habitat connectivity and build linkages between Desert Tortoise designated critical habitat, known populations of Desert Tortoise, and/or other preserve lands;
  - b. Provide habitat for Desert Tortoise with capacity to regenerate naturally when disturbances are removed;
  - c. Be prioritized near larger blocks of lands that are either already protected or planned for protection, such as DWMA's, within the Colorado Desert Recovery Unit (Chuckwalla DWMA as first priority, Chemehuevi DMWA as the second) or which could feasibly be protected long-term by a public resource agency or a non governmental organization dedicated to habitat preservation;
  - d. Be connected to lands with Desert Tortoise habitat equal to or better quality than the project site, ideally with populations that are stable, recovering, or likely to recover;
  - e. Not have a history of intensive recreational use or other disturbance that does not have the capacity to regenerate naturally when disturbances are removed or might make habitat recovery and restoration infeasible;
  - f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;
  - g. Not contain hazardous wastes that cannot be removed to the extent that the site could not provide suitable habitat; and
  - h. Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with CDFW, the BLM, and USFWS, agrees in writing to the acceptability of the land.

2. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM, CDFW, USFWS, and the BLM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for Desert Tortoise in relation to the criteria listed above. Approval from the CPM and CDFW, in consultation with the BLM and the USFWS, shall be required for acquisition of all compensatory mitigation parcels.
3. Compensation Lands Acquisition Requirements. The project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM and CDFW, in consultation with the BLM and the USFWS, have approved the proposed compensation lands:
  - a. Preliminary Report. The project owner, or approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM and CDFW. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM and CDFW, in consultation with the BLM and the USFWS. For conveyances to the State, approval may also be required from the California Department of General Services, the Fish and Game Commission, and the Wildlife Conservation Board.
  - b. Title/Conveyance. The project owner shall transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement as required by the CPM and CDFW. Transfer of either fee title or an approved conservation easement will usually be sufficient, but some situations, e.g., the donation of lands burdened by a conservation easement to the BLM, will require that both types of transfers be completed. Any transfer of a conservation easement or fee title must be to CDFW, a non profit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code, section 65965), or to the BLM under terms approved by the CPM and CDFW. If an approved non profit organization holds title to the compensation lands, a conservation easement shall be recorded in favor of CDFW in a form approved by CDFW. If an approved nonprofit organization holds a conservation easement, CDFW shall be named a third-party beneficiary. If a Security is provided, the project owner or an approved third party shall complete the

proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities.

- c. Initial Habitat Improvement Fund. The project owner shall fund the initial protection and habitat improvement of the compensation lands. Alternatively, a nonprofit organization may hold the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code, section 65965) and if it meets the approval of CDFW and the CPM. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.
- d. Property Analysis Record. Upon identification of the compensation lands, the project owner shall conduct a Property Analysis Record (PAR) or PAR-like analysis to establish the appropriate long-term maintenance and management fee to fund the in-perpetuity management of the acquired mitigation lands.
- e. Long-term Maintenance and Management Fund. In accordance with **BIO-29**, the project owner shall deposit in the REAT Account, or with another CPM-approved entity, a capital long-term maintenance and management fee in the amount determined through the PAR or PAR-like analysis conducted for the compensation lands.

The CPM, in consultation with CDFW, may designate another nonprofit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT Account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision.

- f. Interest, Principal, and Pooling of Funds. The project owner shall ensure that an agreement is in place with the long-term maintenance and management fee holder/manager to ensure the following conditions:
  - i. Interest. Interest generated from the initial capital long-term maintenance and management fee shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement

- measures, and any other action approved by CDFW designed to protect or improve the habitat values of the compensation lands.
- ii. Withdrawal of Principal. The long-term maintenance and management fee principal shall not be drawn upon unless such withdrawal is deemed necessary by the CDFW or the approved third-party, long-term maintenance and management fee manager to ensure the continued viability of the species on the compensation lands. If CDFW takes fee title to the compensation lands, monies received by CDFW pursuant to this provision shall be deposited in a special deposit fund established solely for the purpose to manage lands in perpetuity unless CDFW designates another entity to manage the long-term maintenance and management fee for CDFW.
  - iii. Pooling Long-Term Maintenance and Management Fee Funds. CDFW or a CPM and CDFW approved nonprofit organization qualified to hold long-term maintenance and management fees solely for the purpose to manage lands in perpetuity, may pool the endowment with other endowments for the operation, management, and protection of the compensation lands for local populations of Desert Tortoise. However, for reporting purposes, the long-term maintenance and management fee fund must be tracked and reported individually to the CDFW and CPM.
  - g. Other Expenses. In addition to the costs listed above, the project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including, but not limited to, title and document review costs, expenses incurred from other state agency reviews, and overhead related to providing compensation lands to CDFW or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.
  - h. Mitigation Security. The project owner shall provide financial assurances in accordance with **BIO-29** to the CPM and CDFW with copies of the document(s) to the BLM and the USFWS, to guarantee that an adequate level of funding is available to implement the mitigation measures described in this condition. These funds shall be used solely for implementation of the measures associated with the project in the event the project owner fails to comply with the requirements specified in this condition, or shall be returned to the project owner upon successful compliance

with the requirements in this condition. The CPM's or CDFW's use of the security (Security) to implement measures in this condition may not fully satisfy the project owner's obligations under this condition. Financial assurance can be provided to the CPM and CDFW in the form of an irrevocable letter of credit, a pledged savings account or another form of Security. Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval in consultation with CDFW, the BLM, and the USFWS, of the form of the Security. Security shall be provided as described in **BIO-29 - Table 3** and the beginning of the conditions of certification subsection. The actual costs to comply with this condition will vary depending on the final footprint of the project and the actual costs of acquiring, improving, and managing the compensation lands.

- i. REAT Account. The project owner may elect to fund the acquisition and initial improvement of compensation lands by depositing funds for that purpose into the REAT account. Initial deposits for this purpose must be made in the same amounts as the Security required in section 3.h. above, and may be provided in lieu of Security. If this option is used for the acquisition and initial improvement, the project owner shall make an additional deposit into the REAT account if necessary to cover the actual acquisition costs and administrative costs and fees of the compensation land purchase once land is identified and the actual costs are known. If the actual costs for acquisition and administrative costs and fees are less than described in **Biological Resources - Table 6b** (of the FSA [Exhibit 2000]), the excess money deposited in the REAT account shall be returned to the project owner. Money deposited for the initial protection and improvement of the compensation lands shall not be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to an authorized third party, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission and CDFW. Such delegation shall be subject to approval by the CPM and CDFW, in consultation with the BLM and USFWS, prior to land acquisition, initial protection, or maintenance and management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be implemented within 18 months of the Energy Commission's approval.

**VERIFICATION:** If the mitigation actions required under this condition are not completed prior to the start of ground-disturbing activities including site mobilization construction, the project owner shall provide the CPM and CDFW with an approved form of Security in accordance with this condition of certification no later than 30 days prior to beginning project ground-disturbing activities, including site mobilization and construction. Actual Security shall be provided no later than seven days prior to the beginning of project ground-disturbing activities. If Security is provided, the project owner or an approved third party shall complete and provide written verification to the CPM, CDFW, the BLM, and USFWS of the compensation lands acquisition and transfer within 18 months of the start of project ground-disturbing activities, including site mobilization construction.

The project owner may elect to fund the acquisition and initial improvement of compensation lands through the REAT or other approved third party by depositing funds for that purpose into the REAT account. Initial deposits for this purpose must be made in the same amounts as the Security required in section 3.h. of this condition. Payment of the initial funds for acquisition and initial improvement must be made at least 30 days prior to the start of ground-disturbing activities.

No fewer than 90 days prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the CPM, CDFW, USFWS, and the BLM describing the parcels intended for purchase and shall obtain approval from the CPM and CDFW prior to the acquisition.

No fewer than 30 days after acquisition of the property the project owner shall deposit the funds required by section 3e above (long term management and maintenance fee), and provide proof of the deposit to the CPM.

The project owner, or an approved third party, shall provide the CPM, CDFW, the BLM, and USFWS with a management plan for the compensation lands within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan for the compensatory mitigation lands, in consultation with CDFW, the BLM, and the USFWS.

Within 90 days after completion of all project-related ground disturbance, the project owner shall provide to the CPM, CDFW, the BLM, and USFWS an analysis, based on aerial photography, with the final accounting of the amount of habitat disturbed during project construction. This shall be the basis for the final number of acres required to be acquired.

## **RAVEN MANAGEMENT PLAN AND FEE**

**BIO-13** The project owner shall implement a Raven Monitoring, Management, and Control Plan (Raven Plan) that is consistent with the most current USFWS-approved raven management guidelines, and which meets the approval of the CPM in consultation with the BLM, USFWS, and CDFW.

The draft Raven Plan submitted by the project owner (AECOM 2010a, attachment **DR-BIO-57**) shall provide the basis for the revised draft and final Raven Plan, subject to review, revisions, and approval from the CPM, the BLM, USFWS, and CDFW. The Raven Plan shall include, but not be limited to, a program to monitor raven presence in the project vicinity, determine if raven numbers are increasing, and to implement raven control measures as needed based on that monitoring. The purpose of the plan is to avoid any project-related increases in raven numbers during construction, operation, and closure. In addition, the project owner shall also provide funding for implementation of the USFWS Regional Raven Management Program, as described below.

1. The Raven Plan shall:
  - a. Identify conditions associated with the project that might provide raven subsidies or attractants;
  - b. Describe management practices to avoid or minimize conditions that might increase raven numbers and predatory activities;
  - c. Describe control practices for ravens;
  - d. Establish thresholds that would trigger implementation of control practices;
  - e. Address monitoring and nest removal during construction and for the life of the project; and
  - f. Discuss reporting requirements.
2. USFWS Regional Raven Management Program. The project owner shall submit payment to the project sub-account of the REAT account to support the USFWS Regional Raven Management Program. The one-time fee shall be as described by the USFWS in the Renewable Energy Development and Common Raven Predation on the Desert Tortoise – Summary dated May 2010 (USFWS 2010a) and the Cost Allocation Methodology for Implementation of the Raven Plan dated July 9, 2010, or more current guidance as provided by USFWS or CDFW (USFWS 2010b).

**VERIFICATION:** At least 45 days prior to any project-related ground disturbance activities, the project owner shall submit the revised draft Raven Plan to the CPM for review and approval and the BLM, USFWS, and CDFW for review and comment. No less than 10 days prior to the start of any project-related ground disturbance activities, including pre-construction site mobilization, the project owner shall provide the CPM, the BLM, USFWS, and CDFW with the final version of a Raven Plan. All modifications

to the approved Raven Plan shall be made only with approval of the CPM in consultation with the BLM, USFWS, and CDFW.

No less than 10 days prior to the start of any project-related ground disturbance, including pre-construction site mobilization, and construction activities, the project owner shall provide documentation to the CPM, the BLM, USFWS, and CDFW that the one-time fee for the USFWS Regional Raven Management Program of has been deposited to the REAT-NFWS sub-account for the project. Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Raven Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

As part of the annual compliance report, each year following construction the Designated Biologist shall provide a report to the CPM that includes a summary of the results of raven management and control activities for the year, a discussion of whether raven control and management goals for the year were met, and recommendations for raven management activities for the upcoming year.

## **WEED MANAGEMENT PLAN**

**BIO-14** The project owner shall implement a Weed Management Plan that meets the approval of the CPM. The objective of the Weed Management Plan shall be to prevent the introduction of any new weeds and the spread of existing weeds as a result of project site mobilization, construction, operation, and closure. The draft Weed Management Plan, submitted by the project owner (Palen 2013u, Response to Data Request 52) shall provide the basis for the final Weed Management Plan, subject to review and revisions from the CPM and the BLM. The Weed Management Plan shall include the following:

1. Weed Plan Requirements. The project owner shall provide a map to the CPM indicating the location of the Weed Management Area, which shall include all areas within 100 feet of the Project Disturbance Area, access roads, staging and lay-down sites, and all other areas subject to temporary disturbance. The project owner shall provide a Weed Management Plan for the Weed Management Area including, at a minimum, the following information: specific weed management objectives and measures for each target non-native weed species; baseline conditions; a map of the Weed Management Areas; map of existing populations of target weeds within 100 feet of the Project Disturbance Area and access roads; weed risk assessment; measures to prevent the introduction and spread of weeds; measures to minimize the risk of unintended harm to wildlife and other plants from weed control activities; monitoring and surveying methods; and reporting

requirements. Weed control described in the Weed Management Plan shall focus on prevention, early detection of new infestations, and early eradication for the life of the project. Weed control along the project linears shall be limited to the areas where soils were disturbed during construction. Weed monitoring shall occur a minimum of once per year during the early spring months (March-April) to detect seedlings before they set seed. The focus of the Weed Management Plan shall be on avoiding the introduction of new invasive weeds or the spread of highly invasive species, such as Sahara mustard. Non-native species with low ecological risk, or that are very widespread such as Mediterranean grass, shall be noted, but control shall not be required. When detected, infestations of high priority species shall be eradicated immediately.

2. Avoidance and Treatment of Dense Weed Populations. The Weed Management Plan shall include a requirement to flag and avoid dense populations of the most invasive non-native weeds during any project-related construction operation in or adjacent to infestations. If these areas cannot be avoided, they shall be pre-treated by one of the following methods: a) treating the infested areas in the season prior to construction by removing and properly disposing of seed heads by hand prior to maturity, or spraying the new crop of plants that emerge in early spring, the season prior to construction, to reduce the viable seed contained in the soil, or b) removing and disposing the upper two inches of soil and disposing it off site at a sanitary landfill or other site approved by the County Agricultural Commissioner, or burying the infested soil, e.g., under the solar facility or in a pit and covering the infested soil with at least three feet of uncontaminated soil.
3. Cleaning Vehicles and Equipment. The Weed Management Plan shall include specifications and requirements for the cleaning and removal of weed seed and weed plant parts from vehicles and equipment involved in project-related construction and operation. Vehicles and equipment working in weed-infested areas (including previous job sites) shall be required to clean the equipment tires, tracks, and undercarriage *before* entering the project area and before moving to infested areas of the Project Disturbance Area to uninfested areas. Cleaning shall be conducted on all track and bucket/blade components to adequately remove all visible dirt and plant debris. Cleaning using hand tools such as brushes, brooms, rakes, or shovels is preferred. If water must be used, the water/slurry shall be contained to prevent seeds and plant parts from washing into adjacent habitat.
4. Safe Use of Herbicides. The final Weed Management Plan shall include detailed specifications for avoiding herbicide and soil stabilizer

drift, and shall include a list of herbicides and soil stabilizers that will be used on the project with manufacturer's guidance on appropriate use and include a copy of the Pesticide Use Permit issued by the BLM. The Weed Management Plan shall indicate where the herbicides will be used and what techniques will be used to avoid chemical drift or residual toxicity to special-status species and their pollinators, consistent with the Nature Conservancy Guidelines and the criteria under #2 below. Only weed control measures for target weeds with a demonstrated record of success shall be used based on the best available information from sources such as The Nature Conservancy's *The Global Invasive Species Team, California Invasive Plant Council*: [http://www.cal-ipc.org/ip/management/plant\\_profiles/index.php](http://www.cal-ipc.org/ip/management/plant_profiles/index.php), and the California Department of Food & Agriculture Encyclopededia: [http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia\\_h\\_p.htm](http://www.cdfa.ca.gov/phpps/ipc/encycloweedia/encycloweedia_h_p.htm).

5. The methods for weed control described in the final Weed Management Plan shall meet the following criteria:
  - a. Manual: Well-timed removal of plants or seed heads with hand tools; seed heads and plants must be disposed of in accordance with guidelines from the Riverside County Agricultural Commissioner.
  - b. Chemical: Herbicides known to have residual toxicity, such as pre-emergents and pellets, shall not be used in natural areas or within the engineered channels. Only the following application methods may be used: wick (wiping onto leaves); inner bark injection; cut stump; frill or hack and squirt (into cuts in the trunk); basal bark girdling; foliar spot spraying with backpack sprayers or pump sprayers at low pressure or with a shield attachment to control drift, and only on windless days, or with a squeeze bottle for small infestations (see Nature Conservancy guidelines described above);
  - c. Biological: Biological methods may be used subject to review and approval by the BLM, USFWS, and CDFW and only if approved for such use by CDFW, and are either locally native species of weeds or have no demonstrated threat of naturalizing or hybridizing with native species; and
  - d. Mechanical: Disking, tilling, and mechanical mowers or other heavy equipment shall not be employed in natural areas, but hand weed trimmers (electric or gas-powered) may be used. Mechanical trimmers shall not be used during periods of high fire risk and shall only be used with implementation of fire prevention measures.

**VERIFICATION:** No less than 10 days prior to start of any project-related ground disturbance activities including site mobilization and construction, the project owner shall provide the CPM with the final version of a Weed Management Plan that has been reviewed by the BLM and Energy Commission Staff. Modifications to the approved Weed Management Plan shall be made only with approval from the CPM in consultation with the BLM.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the Weed Management Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which items are still outstanding.

As part of the Annual Compliance Report, each year following construction the Designated Biologist shall provide a report to the CPM and the BLM that includes a summary of the results of noxious weeds surveys and management activities for the year, a discussion of whether weed management goals for the year were met, and recommendations for weed management activities for the upcoming year.

## **PRE-CONSTRUCTION NEST SURVEYS AND AVOIDANCE MEASURES**

**BIO-15** Pre-construction nest surveys shall be conducted if site mobilization and construction activities would occur from February 1st through July 31st. The Designated Biologist or biological monitor conducting the surveys shall be experienced bird surveyors familiar with standard nest-locating techniques such as those described in Martin and Guepel (1993). The goal of the nesting surveys shall be to identify the general location of the nest sites sufficient to establish a protective buffer zone around the potential nest site, and need not include identification of the precise nest locations. Surveyors performing nest surveys shall not concurrently be conducting Desert Tortoise surveys. The bird surveyors shall perform surveys in accordance with the following guidelines:

1. Surveys shall cover all potential nesting habitat in areas that could be disturbed by construction . Surveys shall also include areas within 500 feet of the boundaries of the active construction areas (including linear facilities);
2. At least two pre-construction surveys shall be conducted, separated by a minimum 10-day interval. One of the surveys shall be conducted within the 14-day period preceding initiation of construction activity. Additional follow-up surveys may be required if periods of construction inactivity exceed three weeks, an interval during which birds may establish a nesting territory and initiate egg laying and incubation;

3. If active nests or suspected active nests are detected during the survey, a buffer zone (protected area surrounding the nest, the size of which is to be determined by the Designated Biologist in consultation with CDFW) and monitoring plan shall be developed. Nest locations shall be mapped and submitted along with a report stating the survey results to the CPM; and
4. The Designated Biologist or biological monitor shall monitor the nest until he or she determines that nestlings have fledged and dispersed; activities that might in the opinion of the Designated Biologist disturb nesting activities shall be prohibited within the buffer zone until such a determination is made.

**VERIFICATION:** At least 10 days prior to the start of any site mobilization and construction -related ground disturbance activities during the nesting season, the project owner shall provide the CPM a letter-report describing the findings of the pre-construction nest surveys, including the time, date, and duration of the survey, identity and qualifications of the surveyor(s), and a list of species observed. If active or suspected active nests are detected during the survey, the report shall include a map or aerial photo identifying the location or suspected location of the nest, and shall depict the boundaries of the no-disturbance buffer zone around the nest(s) that would be avoided during project construction.

Each year during construction, as part of the annual compliance report, a follow-up report shall be provided to the CPM, the BLM, CDFW, and USFWS describing the success of the buffer zones in preventing disturbance to nesting activity and a brief description of the outcome of the nesting effort (for example, whether young were successfully fledged from the nest or if the nest failed).

## **AVIAN ENHANCEMENT AND CONSERVATION PLAN**

**BIO-16a** The project owner shall implement the following measure to conserve and enhance avian populations in the vicinity of the project and throughout the region:

1. Regional Avian Electrocutation Risk and Cable Collision Avoidance Measures. Consistent with the DRECP framework (DRECP 2012), the project owner shall, prior to the commencement of commercial operations at the facility, fund the retrofitting of noncompliant utility poles in the vicinity of the project to APLIC (2006) standards, or fund the installation of bird diverters in the vicinity of the project. A total amount of \$150,000.00 will be provided for these enhancements. The funding shall be provided to an independent third party who will perform the actual retrofitting pursuant to a Retrofit Plan approved by the CPM.

The Retrofit Plan will develop a tiered approach to minimizing electrocution and collision risk wherein the first funding is applied to retrofit poles in areas where either mortalities are highest or area use is highest. The second tier of retrofitted poles would be areas of lesser importance. If funds remain available after first and second tier poles have been retrofitted, then the CPM may apply the remaining funds to other avian protection objectives outlined by the DRECP in conjunction with the BLM, USFWS, and CDFW. As an alternative to the Retrofitting Plan and the use of a CPM-approved third party, the total funding can be accomplished by making a payment in the amount of \$300,000 to the National Fish and Wildlife Foundation's Bald and Golden Eagle Protection Act account.

2. Additional Migratory Bird Conservation: The project owner shall, prior to the commencement of commercial operation of the facility, provide funds for mitigation in one of two ways:
  - a. Pay \$1,500,000.00 to fund the activities of a CPM-approved third party that will perform additional migratory bird, bat and insect conservation measures. Alternatively, the project owner may prepare a promissory note to deposit said funds at the onset of operations while at the same time providing funding of the initial year of mitigation in the non refundable amount of \$50,000.00 to a project fund as determined by CPM in conjunction with the BLM, CDFW, and USFWS for the initial year of mitigation in the absence of accrued interest.
  - b. Alternatively, the project owner may pay \$50,000.00 annually to fund the annual activities of the CPM-approved third party for the life of the project, not to exceed a period of 30 years commencing at commercial operation. If the project owner elects to make annual payments, the annual payments should be adjusted for cost of living increases using the CPI-U (All Urban Consumers) for the Los Angeles CMSA (includes the counties of Los Angeles, Orange, Riverside, San Bernardino and Ventura) as calculated and published by the California Department of Finance ([http://www.dof.ca.gov/html/fs\\_data/latestecondata/FS\\_Price.htm](http://www.dof.ca.gov/html/fs_data/latestecondata/FS_Price.htm)). To avoid the adjustment, the project owner may elect to place the amount of \$50,000.00 in an interest bearing account that would allow the cost of living increases to be paid from such account.
3. Such measures shall be approved by the CPM and may include, but not be limited to: (i) restoration of degraded habitat with native vegetation; (ii) restoration of agricultural fields to bird habitat; (iii)

management of agricultural fields to enhance bird populations; (iv) invasive plant species and artificial food or water source management; (v) control and cleanup of potential avian hazards such as lead or microtrash; (vi) retrofitting of buildings to minimize collisions; (vii) retrofitting of conductors and above ground cables to minimize collisions; (viii) animal control programs; (ix) support for avian and bat research and/or management efforts conducted by entities approved by the CPM within the project's mitigation lands or other approved locations; (x) funding efforts to address avian diseases or depredation due to the expansion of predators in response to anthropomorphic subsidies that may adversely affect birds that use the mitigation lands or other approved locations; and (xi) contribute to the Migratory Bird Conservation Fund managed by the Migratory Bird Conservation Commission.

- a. Neither the principal of the fund nor its earned interest is redeemable by project owner during the life of the project; specifically, the investment instrument will be prepared such that an independent investment firm/management entity manages and distributes monies. When developing the fund instrument, criteria will be established that will trigger the release of the fund residual to the project owner only at the conclusion of the project or, in the event that an alternative technology is implemented to replace the currently proposed solar energy generating facility.
- b. The investment fund residual will be transferred to the project owner under specified conditions:
  - i. At end of the project's life after infrastructure removal has been completed and permit-specified site reclamation criteria have been met; and
  - ii. If the proposed project is converted to an alternative technology that does not impose a similar threat to migratory birds, bats or insects.

## **VERIFICATION:**

### **For Power Line Retrofits:**

1. At least six months prior to commercial operation, the project owner shall submit the draft Retrofit Plan to the CPM for review and approval and the BLM, USFWS, and CDFW for review and comment. At least 30 days prior to commercial operation, the project owner shall provide the CPM the final version of the Retrofit Plan. Any modifications to the approved Retrofit Plan must be approved by the CPM in consultation with the BLM, USFWS, and CDFW. The project owner shall notify the CPM no less than five working days before implementing any CPM approved modifications to the Retrofit Plan; alternately, the project owner may elect to deposit funds into the National Fish and Wildlife Foundation's Bald and Golden Eagle Protection Act account.
2. If the project owner elects not to fund a third party to perform retrofits, then no less than 30 days prior to beginning commercial operations, the project owner shall provide written verification to the CPM that Security has been established in the National Fish and Wildlife Foundation's Bald and Golden Eagle Protection Act account, in accordance with this condition of certification.
3. The project owner shall provide an annual summary of the actions taken, an accounting of money distributed, and a map of retrofitted power lines as per the Retrofit Plan. If the project owner elects to fund the National Fish and Wildlife Foundation's Bald and Golden Eagle Protection Act account, then the project owner shall, within five years of starting commercial operations, provide a summary specifying how the National Fish and Wildlife Foundation has or is using the funds.

### **For Interest Bearing Fund:**

1. No later than 30 days prior to commercial operation, the project owner shall provide the CPM written verification of selection of a interest-bearing account held by an approved investment entity, in accordance with this condition of certification. The account shall be fully funded no later than seven days prior to commercial operation.
2. If the project owner elects to provide a promissory note for \$1,500,000.00 the CPM must be provided the note within 30 days of starting operations, and must also fund \$50,000.00 for the first year's benefit, within seven days of starting operations.
3. The project owner or the account's administrator (investment entity) shall submit to the CPM an annual report summarizing the performance of the fund and describing all restoration/enhancement actions taken.

## **AVIAN, BAT, AND INSECT PROTECTION PLAN**

- BIO-16b** The project owner shall prepare a Bird, Bat, and Insect Conservation Strategy (BBCS) and submit it to the CPM for review and approval, in conjunction with the BLM, CDFW, and USFWS for review and comment. The BBCS shall provide for the following:

1. Survey and monitor on-site and off-site avian, bat, and insect use and behavior to document species composition on and off site, compare on site and off-site rates of avian, bat, and insect use, document changes in use over time, and evaluate the general behavior of birds, bats, and insects in and near the facility;
2. Implement an on-site and off-site (if feasible) avian and bat mortality and injury monitoring program to identify the extent of potential avian, bat, and insect mortality or injury from collisions with facility structures or from elevated levels of solar flux that may be encountered within the facility airspace, including:
  - a) assessing levels of collision-related mortality and injury with heliostats, perimeter fences and power tower structures;
  - b) calculating rates of solar flux-related avian mortality and injury, if any;
  - c) documenting seasonal, temporal, and weather-related patterns associated with collision- or solar flux-related mortality and injury, if any;
  - d) documenting flight spatial patterns that may be associated with collision- or flux-related mortality and injury, if any; and
  - e) Documenting spatial patterns that may be associated with avoidance of the facility.
3. Identify specific deterrence and operational measures and/or programs to minimize impacts and evaluate and respond to the effectiveness of those measures;
4. Establish a rehabilitation program to provide for the care and recovery of birds and bats injured by solar flux;
5. Establish a \$10 million interest-bearing account to be used for conservation and other species enhancements measures should the CPM, in coordination with the BLM, USFWS, and CDFW determine, based on surveys and monitoring data, that impacts have not been reduced to a level of insignificance.

### **BBCS Components**

The project owner shall prepare and implement a BBCS adopting all requirements applicable to solar generation in current guidelines recommended by the USFWS (currently 2012 USFWS Land Based Wind Energy Guidelines). The BBCS shall include the following components:

1. Preconstruction Baseline Survey Results. A description and summary of the baseline survey methods and results;

2. Avian and Bat Use and Behavior Surveys. Avian and bat site use behavior surveys shall be conducted. The program will outline survey methodology and field documentation, identification of appropriate on-site and off-site survey locations, control sites, and the seasonal considerations. Prey abundance surveys will also be conducted to identify the locations and changes in the abundance of prey species. Bat acoustic sampling may be implemented depending on results of the baseline study;
3. Avian and Bat Mortality and Injury Monitoring. An avian and bat injury and mortality monitoring program shall be implemented, including:
  - a. On-site monitoring that will systematically survey representative locations within the facility at a level that will produce statistically robust data, account for potential spatial bias, and allow for the extrapolation of survey results to unsurveyed areas and the survey interval based on scavenger and searcher efficiency trials and detection rates.
  - b. Off-site monitoring, to the extent that access can be reasonably and feasibly obtained by the project owner, of one or more locations adjacent to the project facilities using the same or comparable methods as implemented for the on-site monitoring to identify which avian species potentially injured by collisions or solar flux within adjacent areas.
  - c. Low-visibility and high-wind weather event monitoring to document potential weather-related collision risks that may be associated with the power tower at the facility, including foggy, highly overcast, or rainy night-time weather typically associated with an advancing frontal system, and high wind events (40 mile per hour winds) are sustained for period of greater than 4 hours. The monitoring report shall include survey frequency, locations and methods.
  - d. Scavenger and searcher efficiency trials to document the extent to which avian or bat fatalities remain visible over time and can be detected within the project area and to adjust the survey timing and survey results to reflect scavenger and searcher efficiency rates.
  - e. Statistical methods used to generate facility estimates of potential avian and bat impacts based on the observed number of detections during standardized searches during the monitoring season for which the cause of death can be determined and is determined to be facility-related.

- f. Field detection and mortality or injury identification, cause attribution, handling and reporting protocols consistent with applicable legal requirements.

4. Flying Insect Use and Behavior Monitoring. An insect behavior and mortality monitoring program shall be implemented during construction and operation of the project. The results of insect monitoring data shall be reported directly to the CPM and the project owner, as well as all raw data and field notes. Monitoring activities will be designed with the goal of answering the following questions:

- Identify if state or federally protected insects are subject to mortality;
- Document mortality rate of migratory and nonmigratory species, particularly declining and migratory species such as Monarch Butterflies;
- Evaluate the effects of project features such as the solar tower, solar receiver, and heliostats as potential attractants to insects;
- Evaluate the potential for project effects substantially contribute to the decline of any threatened, endangered, or special status insect species;
- Conducting multi season surveys to account for seasonal variations in insect populations and assemblages;
- Perform surveys in off-site locations in up and downwind areas;
- Account for the irruptive ecology of most insects by performing surveys during normal or above average rain years; and
- Evaluate the effectiveness of adaptive management upon insects impacted at the project site. The CPM in consultation with state and federal wildlife agencies shall determine if a long-term monitoring plan is warranted.

5. Adaptive Management. An adaptive management program shall be developed to identify and implement reasonable and feasible measures that would reduce any biologically significant levels of avian or bat mortality or injury attributable to project operations and facilities. The program shall also consider the potential to reduce or minimize any biologically significant level of mortality or threatened or endangered insects. Any such impact reduction measures must be commensurate (in terms of factors that include geographic scope, costs, and scale of effort) to the level of avian or bat mortality or injury that is specifically and clearly

attributable to the project facilities. The adaptive management program shall include the following elements:

Reasonable measures for characterizing the extent and significance of detected avian, bat, and insect mortality and injuries clearly attributable to the project. These measures shall be approved by the CPM, in conjunction with the BLM, USFWS, and CDFW. The Designated Biologist or Biological Monitors shall identify and photograph the injured or dead birds or bats in-situ, as well as a fullframe dorsal, ventral and head view using a camera with an automatic GPS and time/date stamp. The record(s) will be provided to the CPM in the MCR during construction and operation.

Adequate funding provided by the project owner for wildlife rehabilitation activities necessary for injuries clearly attributed to the project or wildlife found on site.

Measures that the project owner will implement to adaptively respond to detected mortality and injuries attributable to the project, including operational measures and passive avian diverter installations along the perimeter or at other locations within the project to avoid site use, the use of sound, light, or other means to discourage site use consistent with applicable legal requirements, on-site prey or habitat control measures consistent with applicable legal requirements, and additional perch and nest proofing of project facilities, or use of deterrent mechanisms in concert with radar or other advance-warning system.

The project owner shall take all feasible steps to prevent or minimize impacts to the cultural landscape that may arise from the deployment of deterrence measures.

6. Mitigation Contingency Fund: Establishment of a \$10 million fund in an interest-bearing account to fund conservation measures that could include, but are not limited to, habitat acquisition, habitat restoration, other methods to increase the population of species impacted by solar flux. This fund is in addition to and independent of the other funding required in Conditions of Certification **Bio-16a**. The CPM, in consultation with the BLM, USFWS, and CDFW shall review monitoring and survey information that is provided during the first 3 years of commercial operation (or longer at the discretion of the CPM) to determine the effectiveness of deterrence and operational measures in minimizing impacts to birds, bats, and insects. Should the Commission find that notwithstanding these measures, impacts to birds, bats, and insects continue to be significant, even taking into account the mitigation implemented by condition **BIO-16a**, the Commission will direct the funding of additional measures to provide

mitigation at a level that is commensurate with the level of identified impacts. Remaining funds, if any, shall be returned to the project owner within 90 days of the California Energy Commission's determination.

Survey Schedule and Period. All surveys and monitoring studies included in the BBCS shall be conducted for three years following commercial operation and approval of the BBCS by the CPM. At the end of the three-year period, the CPM shall meet and confer with the project owner, the BLM, USFWS, and CDFW to determine whether the survey program shall be continued for subsequent periods. The monitoring program may be modified with the approval of the CPM in response to survey results, identified scavenging efficiency rates, or other factors to increase monitoring accuracy and reliability or in accordance with the adaptive management decision-making framework included in the BBCS.

At the conclusion of the survey program, the CPM in consultation with state and federal wildlife agencies shall determine if a long-term monitoring plan is warranted. The level and intensity of surveys will be such that any large-scale mortality events would be detected, and consist of minimal monthly or seasonal sampling of the site. Carcasses would be documented and photographed, and then removed as prescribed by the BBCS.

## **EAGLE PROTECTION PLAN**

**BIO-16c.** The project owner shall prepare and implement an Eagle Protection Plan adopting all requirements applicable to solar generation as outlined in guidelines recommended by the USFWS (currently 2012 USFWS Land Based Wind Energy Guidelines 2011b). The EPP may be prepared as a stand-alone document or included as a chapter within the BBCS. The EPP shall describe all available baseline data on Golden Eagle occurrence, seasonality, activity, and behavior throughout the project area and vicinity. The EPP shall outline a study protocol consistent with item 5 above to include annual pedestrian and/or helicopter surveys of Golden Eagle breeding sites within a 10-mile radius of the project site, to be reviewed and approved by the CPM, in consultation with the USFWS, the BLM, and CDFW.

The EPP shall require Golden Eagle nest surveys and monitoring. Results of annual pedestrian and/or helicopter surveys of Golden Eagle nesting sites within a 10-mile radius of the project site, including a summary of available information concerning Golden Eagle nesting activity in the project vicinity shall be provided to the CPM.

The EPP shall describe all proposed measures to prevent death and injury of eagles from (1) collisions with facility features including the heliostats,

power tower, and generation tie-line towers or transmission lines, (2) electrocutions on transmission lines or other project components, and (3) concentrated solar flux created over the solar field. The EPP shall describe efforts taken pursuant to **BIO-16a** and **BIO-16b**.

The EPP shall also include any feasible adaptive modifications to heliostat positioning during operation (including day time and night time) in order to minimize collisions and/or risk of exposure to concentrated solar flux. Any such adaptive minimization measures must be commensurate (in terms of factors that include geographic scope, costs, and scale of effort) to the level of avian or bat risk that is specifically and clearly attributable to the project facilities. The EPP shall provide a reporting schedule for all monitoring or other activities related to bird or bat conservation or protection during project construction or operation. The EPP shall be subject to review and approval by the CPM in consultation with the BLM, USFWS, and CDFW, and shall be incorporated into the project's BRMIMP and BBCS and implemented.

**VERIFICATION:** The BBCS shall be submitted to the CPM for review and approval and to, the BLM, USFWS, and CDFW for review and comment no less than 60 days after start of construction. The project owner shall provide the CPM with copies of any written or electronic transmittal from the BLM, USFWS, and CDFW related to the BBCS within 30 days of receiving any such transmittal. Survey reports shall be submitted to the CPM after each season and in an annual summary report throughout the course of the three-year study period and as set forth in the approved monitoring study plan (Monitoring Study). The reports will include all monitoring data required as part of the monitoring program.

Methods and results of the Monitoring Study shall be submitted to the CPM in Monthly and Annual Compliance Reports throughout the course of the study, or as otherwise directed by the CPM. The Monitoring Study shall continue until the CPM, in consultation with the BLM, USFWS, and CDFW, concludes that the cumulative monitoring data provide sufficient basis for estimating long-term bird mortality for the project. The reports will include all monitoring data required as part of the monitoring program.

The reports shall also summarize any additional wildlife mortality or injury documented on the project site during the year, regardless of cause, and assess any adaptive management measure implemented during the prior year as approved by the CPM. After the third year of the monitoring program, the CPM shall meet and confer with state and federal wildlife agencies to determine if the study period shall be extended based on data quality and sufficiency of analysis, or if needed, to document efficacy of any adaptive management measures undertaken by the project owner. If a carcass of a Golden Eagle or any state or federally listed threatened or endangered species is found at any time by the monitoring study or project operations staff, the project owner,

Designated Biologist, or other qualified biologist that may be identified by the Designated Biologist shall contact the CPM, the BLM, USFWS, and CDFW by email, fax or other electronic means within one working day of any such detection.

**For Interest Bearing Fund:**

1. Prior to construction, the project owner shall provide the CPM written verification of selection of a interest-bearing account held by an approved investment entity, in accordance with this condition of certification. The account shall be fully funded at a level of \$10,000,000 no later than seven days prior to construction.
2. The project owner or the account's administrator (investment entity) shall submit to the CPM an annual report summarizing the performance of the fund and itemized expenses.

**AMERICAN BADGER AND DESERT KIT FOX IMPACT AVOIDANCE AND MINIMIZATION MEASURES**

**BIO-17** The project owner shall contract with a qualified biologist to conduct a baseline pre-construction desert Kit Fox and American Badger survey and develop and implement an American Badger and Desert Kit Fox Mitigation and Monitoring Plan (Plan). The survey data will be used to revise the final Plan, as necessary, with the most recent species data from the project site.

The project owner shall conduct a baseline Kit Fox census survey and submit a summary report that includes the following procedures:

1. A qualified biologist with demonstrated mammal experience shall complete a baseline pre-construction survey of Desert Kit Fox and American Badger populations on the project site and the anticipated dispersal areas for passive relocation between 30 and 60 days prior to initiation of any ground disturbing activities, including site assessment and construction activities that include installation of Desert Tortoise fencing. The anticipated dispersal areas shall be defined as all suitable Desert Kit Fox habitat within 500 meters of the project boundaries where Desert Kit Fox would likely be displaced. The survey shall identify and record the locations of all potential dens throughout the project site and shall characterize the approximate number and distribution of the badger and kit foxes on the site and anticipated dispersal areas. Depending on the season of the surveys (i.e. breeding or non breeding), other demographic data will be collected if possible to make the necessary determinations. The baseline pre-construction survey shall include the following components:
  - a. Inventory. An inventory and mapped locations of Desert Kit Fox dens and burrows on the project site (including all Project

Disturbance Areas and in the anticipated dispersal areas), and an evaluation of whether each burrow is occupied, and reproductive status of kit foxes (single animal, mated pair, or family group with young), if known. If status unknown, measures as required under item 2b, below will be implemented.

- b. Report. The project owner shall provide a draft Summary Report of the Baseline American Badger and Desert Kit Fox Survey to the CPM and the BLM for review in consultation with CDFW. The project owner and the project owner's Designated Biologist shall consult with the CPM and the BLM on any changes to the final Plan that would result from the baseline pre-construction survey data provided in the Summary Report. The project owner shall not implement the American Badger and Desert Kit Fox Mitigation and Monitoring Plan (below) until receiving the CPM and the BLM's written approval of the final Plan.

The objective of the plan shall be to avoid direct impacts to the American Badger and Desert Kit Fox as a result of site mobilization and construction of the power plant and linear facilities, as well as during project operation and nonoperation and closure. The final plan is subject to review and comment by the BLM and revision and approval by the CPM, in consultation with CDFW. The final Plan shall include, but is not limited to, the following procedures and impact avoidance measures:

2. Describe pre-construction survey and clearance field protocol, to determine the number and locations of single or paired kit foxes or badgers on the project site that would need to be avoided or passively relocated, and the number and locations of Desert Kit Fox or badger burrows or burrow complexes that would need to be collapsed to prevent re-occupancy by the animals.
  - a. Pre-Construction Surveys. A baseline, preconstruction survey shall be conducted as described above under item 1. Surveys may be concurrent with Desert Tortoise and Burrowing Owl surveys to the extent it does not conflict with Desert Tortoise and Burrowing Owl agency protocols. If dens are detected during the survey(s), each den shall be classified as inactive, potentially active, definitely active den, or natal den.
  - b. Monitoring and Protection Measures, Passive Hazing, and Den Excavation. The plan would include details on monitoring requirements, types and methods of passive hazing, and methods

and timing of den excavation, including, but not limited to the following:

- i. Inactive Dens. Inactive dens (e.g. inactive dens are dens that are mostly or entirely silted in and ones in which the back of the den can clearly be seen (e.g., the den isn't deep and doesn't curve) that would be directly impacted by construction activities shall be excavated by hand and backfilled to prevent reuse by badger or kit fox.
- ii. Potentially and Definitely Active Dens. Potentially- and definitely-active dens that would be directly impacted by construction activities shall be monitored by the biological monitor for three consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) and/or infrared camera stations at the entrance. If no tracks are observed in the tracking medium or no photos of the target species are captured after three nights, the den shall be excavated and backfilled by hand. If tracks are observed, the den shall be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next three to five nights to discourage the badger or kit fox from continued use. After verification that the den is unoccupied, it shall then be excavated and backfilled by hand to ensure that no badgers or kit fox are trapped in the den. If the den is proven inactive, then the den may be collapsed during whelping season. The BLM approval may be required prior to release of badgers on public lands.
- iii. Active Natal/Pupping Dens. If an active natal den (a den with pups) is detected on the site, the project owner shall proceed to implement the approved Plan and shall also notify the BLM, CPM, and CDFW within 24 hours. If the situation is unusual and/or not addressed by the approved Plan, then the project owner's biologist shall consult with the CPM, the BLM, and CDFW to determine the appropriate course of action to minimize the potential for animal harm or mortality. The course of action would depend on the age of the pups, location of the den on the site (e.g. is the den in a central area or in a perimeter location), status of the perimeter site fence (completed or not), and the pending construction activities proposed near the den. A 500-foot no-disturbance buffer shall be maintained around all active dens. The denning season for American Badger is approximately March to August, and for Desert Kit Fox the

denning season is approximately mid January to pup independence, typically by July 1st (or with confirmation of pup independence based on monitoring data). If the den is active during the whelping season, even if pups are not seen, disturbance is not allowed. Active natal/pupping dens will not be excavated or passively relocated.

- c. Exception for American Badger. In the event that passive relocation techniques fail for badgers, outside the denning season, or during the denning season if individual badgers can be verified to not have a litter, then live-trapping by a CDFW and CPM approved trapper is an option that may be employed to safely perform active removal as a last resort. A live-trapping plan including trapping methods as well as the name and resume including documentation of relevant handling permits of the proposed trapper, would be included in detail as part of the approved Plan. In the event live-trapping would be employed as a last resort, written notification would be submitted to the CPM for review and approval in consultation with the BLM and CDFW. The CPM, the BLM and CDFW would be notified in writing no less than one week prior to live trapping of badger. The notification would at a minimum include what passive relocation methods have been attempted to date and the justification for live-trapping as a last resort. In addition, timing and location of release of the individual badger, as well as the name of the proposed trapper and their resume including documentation of relevant handling permits, if not previously included and approved in the Plan, shall be included in the notification. The BLM approval may be required prior to release of badgers on public lands.
3. Address other factors and procedures that may affect the success of kit fox and American Badger relocation off site such as:
    - a. Qualitative discussion of availability of suitable habitat on off-site surrounding lands within 10 miles of the project boundary, and evaluation of Kit Fox burrows within 500 meters of the project boundary in areas where on-site foxes may disperse (e.g., by inventorying burrow numbers in selected representative sample areas) as identified in the pre-construction surveys above;
    - b. Estimates of the distances kit foxes would need to travel across the project site and across adjacent lands to safely access suitable habitat (including burrows) off site;
    - c. Proposed scheduling of the passive relocation effort;

- d. Methods to minimize likelihood that the animals will return to the project site;
  - e. Descriptions of any proposed or potential ground disturbing activities related to Kit Fox relocation, and locations of those activities (e.g., artificial burrow construction);
  - f. A monitoring and reporting plan to evaluate success of the relocation efforts and any subsequent re-occupation of the project site; and
  - g. A plan to subsequently relocate any animals that may return to the site (e.g., by digging beneath fences).
4. Address notification procedures for notifying the CPM, the BLM and CDFW if injured, sick, or dead badger or kit fox are detected. Notify the CPM, the BLM, and CDFW if injured, sick, or dead American Badger or Desert Kit Fox are found. If an injured, sick, or dead animal is detected on any area associated with the solar project site or associated linear facilities, the CPM, the BLM Palm Springs/South Coast Field Office and the Ontario CDFW Office, as well as the CDFW Wildlife Investigation Lab (WIL) shall be notified immediately by phone (eight hours in the case of a fatality). Written follow-up notification via FAX or electronic communication shall be submitted to the CPM, the BLM, and CDFW within 24 hours of the incident and shall include the following information as appropriate:
- a. Injured Animals. If an American Badger or Desert Kit Fox is injured because of any project-related activities, the Designated Biologist or approved biological monitor shall immediately notify the CPM, the BLM and CDFW personnel regarding the capture and transport of the animal to CDFW-approved wildlife rehabilitation and/or veterinarian clinic. Following the phone notification, the CPM and CDFW shall determine the final disposition of the injured animal if it recovers. A written notification of the incident shall be sent to the CPM, the BLM and CDFW containing, at a minimum, the date, time, location, and circumstances of the incident.
  - b. Sick Animals. If an American Badger or Desert Kit Fox is found sick and incapacitated on any area associated with the project site or associated linear facilities, the Designated Biologist or approved biological monitor shall immediately notify the CPM, the BLM and CDFW personnel for immediate capture and transport of the animal to a CDFW-approved wildlife rehabilitation and/or veterinary clinic. Following the phone notification, the CPM and CDFW shall determine the final disposition of the sick animal if it recovers. A

necropsy shall be performed by a CDFW-approved facility to determine the cause of death of a deceased animal. The project owner shall pay to have the animal transported and a necropsy performed. A written notification of the incident shall be sent to the CPM, the BLM and CDFW and contain, at a minimum, the date, time, location, and circumstances of the incident.

- c. Fatalities. If an American Badger or Desert Kit Fox is killed because of any project-related activities during construction, operation, and closure, or is found dead on the project site or along associated linear facilities, the Designated Biologist or approved biological monitor shall immediately refrigerate the carcass and notify the CPM, the BLM and CDFW personnel within 24 hours (eight hours in the case of Desert Kit Fox) of the discovery to receive further instructions on the handling of the animal. Handling of a dead kit fox shall follow the most recently issued Guidelines for Handling a Desert Kit Fox Carcass (currently CDFW WIL 2011). A necropsy shall be performed by a CDFW-approved facility to determine the cause of death. The project owner shall pay to have the animal transported and a necropsy performed.
5. Additional protection measures to be included in the Plan and implemented:
    - a. All pipes within the Project Disturbance Area must be capped and/or covered every evening or when not in use to prevent Desert Kit Foxes or other animals from accessing the pipes.
    - b. All project-related water sources shall be covered and secured when not in use to prevent drowning.
    - c. The project owner shall coordinate with CDFW to identify any additional fence design features to maximize the effectiveness of the fence to exclude kit foxes from the project.
    - d. Incorporate and implement the CDFW veterinarian's guidance regarding impact avoidance measures including measures to prevent disease spread among desert kit foxes.
    - e. Include measures to reduce traffic impacts to wildlife if the project owner anticipates night-time construction. The plan must also include a discussion of what information will be provided to all night-time workers, including truck drivers, to educate them about the threats to kit fox, what they need to do to avoid impacts to kit fox, and what to report if they see a live, injured, or dead kit fox.
    - f. In order to reduce the likelihood of distemper transmission:

- i. No pets shall be allowed on the site prior to or during site mobilization and construction, operation, and nonoperation and closure, with the possible exception of vaccinated kit fox scat-detection dogs during preconstruction surveys, and then only with prior CPM and CDFW approval.
  - ii. Any hazing activities that include the use of chemical or other repellents (e.g. ultrasonic noise makers, or non animal-based chemical repellents) must be cleared through the CPM and CDFW prior to use. The use of animal tissue or excretion based repellents (e.g. coyote urine, anal gland products) is not permitted.
6. Any sick or diseased kit fox or documented kit fox mortality shall be reported to the CPM, CDFW, and the BLM immediately upon identification (within eight hours for mortality). If a dead kit fox is observed, it shall be collected and stored according to established protocols distributed by CDFW WIL, and the WIL shall be contacted to determine carcass suitability for necropsy.
7. The project owner may opt to participate in the CDFW-led fee-based Monitoring and Mitigation Program if in place prior to start of site mobilization and construction in lieu of implementation of certain items in 3f, 4b, 4c, 5d, 5f above, and other items above if included in the program when established. This includes financial responsibility for transportation and necropsy of Desert Kit Fox mortalities due to project-related activities or sick animals found on or near the project site or associated linears, as well as measures to address other factors and procedures that may affect the success of kit fox and American Badger relocation off site. If in place, the CDFW Monitoring and Mitigation Program activities associated with the project and associated fees will be fully described in the final Plan. The project owner may also opt to participate in the program if established at a later date during site mobilization and construction or operation and will submit a revised Plan that includes the program information when established and confirmation that fees are paid.

**VERIFICATION:** No fewer than 90 days prior to the start of any site mobilization and construction, the project owner shall provide the CPM, the BLM, and CDFW with a draft American Badger and Desert Kit Fox Mitigation and Monitoring Plan for review and comment.

Between 30 to 60 days prior to initiation of site mobilization and construction activities, a qualified biologist with demonstrated mammal experience shall complete a baseline

study of American Badger and Desert Kit Fox populations on the project site and the anticipated dispersal areas for passive relocation.

The project owner shall submit a summary report to the CPM, the BLM, and CDFW within seven days of completion of any badger and kit fox surveys. The report shall describe survey methods and results of the surveys. The project owner and the Designated Biologist shall consult with the CPM and the BLM upon submitting the summary report regarding any changes to the final Plan.

No fewer than 15 days prior to start of any site mobilization and construction, the project owner shall provide an electronic copy of the CPM-approved final Plan to the CPM, the BLM, and CDFW, and implement the Plan.

No later than 24 hours following a phone notification of an injured, sick, or dead American Badger or Desert Kit Fox, the project owner shall provide to the CPM, the BLM, and CDFW, via FAX or electronic communication, a written report from the Designated Biologist describing the incident of sickness, injury, or death of an American Badger or Desert Kit Fox, when the incident occurred, and who else was notified.

Beginning with the first month after start of construction and continuing every month until construction is completed, the Designated Biologist shall include a summary of events regarding the American Badger and Desert Kit Fox in each MCR. The impact avoidance and minimization measure(s) implemented and the results of implementation of those measures shall be reported in each MCR.

No later than 45 days after initiation of project operation, the Designated Biologist shall provide the CPM and the BLM a final "American Badger and Desert Kit Fox Mitigation and Monitoring Plan Report" that includes: 1) a discussion of all mitigation measures that were, and currently are, being implemented; 2) all information about project-related kit fox and badger injuries and/or deaths; 3) all information regarding sick kit fox and badger found within the project site and along related linear facilities; and 4) recommendations on how mitigation measures might be changed to more effectively minimize and mitigate the impacts of future projects on the American Badger and Desert Kit Fox.

Within 30 days of participation in the CDFW-led fee-based Monitoring and Mitigation Program during site mobilization and construction or operation, the project owner will submit a revised Plan that includes the program information related to the project and confirmation that all fees are paid.

## **BURROWING OWL IMPACT AVOIDANCE, MINIMIZATION, AND COMPENSATION MEASURES**

**BIO-18** The project owner shall implement the following measures to avoid, minimize and offset impacts to Burrowing Owls:

1. Pre-Construction Surveys. The Designated Biologist or biological monitor shall conduct pre-construction surveys for Burrowing Owls no more than 30 days prior to initiation of site mobilization and construction activities in accordance with CDFW guidelines (CDFW 2012). Surveys shall be focused exclusively on detecting Burrowing Owls, and shall be conducted from two hours before sunset to one hour after or from one hour before to two hours after sunrise. The survey area shall include the Project Disturbance Area and surrounding 500 foot survey buffer.
2. Implement Burrowing Owl Mitigation Plan. The project owner shall implement measures described in the final Burrowing Owl Mitigation Plan. The final Burrowing Owl Mitigation Plan shall be approved by the CPM, in consultation with the BLM, USFWS and CDFW, and shall:
  - a. Identify suitable sites within one mile of the Project Disturbance Areas for creation or enhancement of burrows prior to passive relocation efforts;
  - b. Provide guidelines for creation or enhancement of at least two natural or artificial burrows per relocated owl; design of the artificial burrows shall be consistent with CDFW guidelines (CDFW 2012) and shall be approved by the CPM in consultation with the BLM, USFWS, and CDFW;
  - c. Provide detailed methods and guidance for passive relocation of Burrowing Owls occurring within the Project Disturbance Area; and
  - d. Describe monitoring and management of the passive relocation effort, including the created or enhanced burrow location and the project area where Burrowing Owls were relocated from, and provide a reporting plan.
3. Implement Avoidance Measures. If an active Burrowing Owl burrow is detected within 500 feet from the Project Disturbance Area, the following avoidance and minimization measures shall be implemented:
  - a. Establish Non Disturbance Buffer. Fencing shall be installed at a 250-foot radius from the occupied burrow to create a non disturbance buffer around the burrow. The non disturbance buffer and fence line may be reduced to 160 feet if all project-related

activities that might disturb Burrowing Owls would be conducted during the non breeding season (September 1st through January 31st). Signs shall be posted in English and Spanish at the fence line indicating no entry or disturbance is permitted within the fenced buffer.

- b. Monitoring. If construction activities would occur within 500 feet of the occupied burrow during the nesting season (February 1st – August 31st), the Designated Biologist or biological monitor shall monitor to determine if these activities have potential to adversely affect nesting efforts, and shall make recommendations to minimize or avoid such disturbance.
4. Acquire Burrowing Owl Habitat. The project owner shall acquire, in fee or in easement land suitable to support a resident population of Burrowing Owls and shall provide funding for the enhancement and long-term management of these compensation lands. The responsibilities for acquisition and management of the compensation lands may be delegated by written agreement to CDFW or to a third party, such as a nongovernmental organization dedicated to habitat conservation, subject to approval by the CPM, in consultation with the BLM, USFWS, and CDFW prior to land acquisition or management activities. Additional funds shall be based on the adjusted market value of compensation lands at the time of construction to acquire and manage habitat.
    - a. Criteria for Burrowing Owl Mitigation Lands. The terms and conditions of this acquisition or easement shall be as described in **BIO-12** (Desert Tortoise Compensatory Mitigation), with the additional criteria to include 1) mitigation land per **BIO-29 - Table 2** that must provide suitable habitat for Burrowing Owls, and 2) the acquisition lands must either currently support Burrowing Owls or be within dispersal distance from areas occupied by Burrowing Owls (generally approximately five miles). The Burrowing Owl mitigation lands may be included with the Desert Tortoise mitigation lands **ONLY** if these two Burrowing Owl criteria are met. If the Burrowing Owl mitigation land is separate from the acreage required for Desert Tortoise compensation lands, the project owner shall fulfill the requirements described below in this condition.
    - b. Security. If the Burrowing Owl mitigation land is separate from the acreage required for Desert Tortoise compensation lands, the project owner or an approved third party shall complete acquisition of the proposed compensation lands within the time period

specified for this acquisition (see the verification section at the end of this condition). Alternatively, financial assurance can be provided by the project owner to the CPM and CDFW, according to the measures outlined in **BIO-12**. The amount of the security shall be as described in **BIO-29 - Table 3** for the proposed project or any of the project alternatives. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of Security prior to initiating ground-disturbing project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with the BLM, USFWS, and CDFW to ensure funding. The final amount due will be determined by an updated appraisal and PAR analysis conducted as described in **BIO-12**.

**VERIFICATION:** If pre-construction surveys detect Burrowing Owls within the Project Disturbance Area and relocation of the owls is required, within 30 days of completion of the Burrowing Owl pre-construction surveys, the project owner shall submit to the CPM, the BLM, USFWS, and CDFW a Burrowing Owl Mitigation Plan. The Burrowing Owl Mitigation Plan shall identify suitable areas for construction of burrows and the other passive relocation as described above. As part of the Annual Compliance Report, each year following construction for a period of five years, the Designated Biologist shall provide a report to the CPM, the BLM, USFWS, and CDFW that describes the results of monitoring and management of the Burrowing Owl burrow creation or enhancement area(s).

If pre-construction surveys detect Burrowing Owls within 500 feet of proposed construction activities, at least 10 days prior to the start of any project-related site disturbance activities, the Designated Biologist shall provide to the CPM, the BLM, USFWS, and CDFW documentation indicating that non disturbance buffer fencing has been installed as described above. The project owner shall report monthly to the CPM, the BLM, CDFW, and USFWS for the duration of construction on the implementation of Burrowing Owl avoidance and minimization measures. Within 30 days after completion of construction, the project owner shall provide to the CPM and CDFW a written report identifying how mitigation measures described in the Plan have been completed.

No less than 30 days prior to the start of site mobilization and construction activities, the project owner shall provide the CPM with an approved form of Security in accordance with this condition of certification. Actual Security for acquisition of 78 acres of Burrowing Owl habitat shall be provided no later than seven days prior to the beginning of site mobilization and construction activities.

No fewer than 90 days prior to the land or easement purchase, as determined by the date on the title, the project owner shall provide the CPM with a management plan for review and approval, in consultation with the BLM, USFWS, and CDFW, for the compensation lands and associated funds.

No later than 18 months from initiation of construction, the project owner shall provide written verification to the CPM that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient.

## **SPECIAL-STATUS PLANT IMPACT AVOIDANCE, MINIMIZATION AND COMPENSATION**

**BIO-19** This condition contains the following four sections:

**Section A: Special-Status Plant Impact Avoidance and Minimization Measures** contains the BMP and other measures designed to avoid accidental indirect impacts to plants during site mobilization, construction, operation, and closure. The measures are required for special-status plants located outside of the Project Disturbance Area and within 100 feet of the Project Disturbance Area. The same measures shall also be implemented for plants within the Project Disturbance Area that are avoided pursuant to section C of this condition.

**Section B: Conduct Late Season Botanical Surveys** describes guidelines for conducting summer-fall 2013 surveys to detect special-status plants that would have been missed during the spring 2013 surveys.

**Section C: Avoidance Requirements for Special-Status Plants** detected in the summer/fall 2013 surveys outlines the level of on-site avoidance required for any special-status plants detected during the summer-fall surveys, and specifies when off-site mitigation is required.

**Section D: Off-site Compensatory Mitigation for Special-Status Plants** describes performance standards for off-site mitigation through acquisition or restoration/enhancement.

The “Project Disturbance Area” encompasses all areas to be temporarily and permanently disturbed by the project, including the plant site, linear facilities, and areas disturbed by temporary access roads, fence installation, construction work lay-down, and staging areas, parking, storage, or by any other activities resulting in disturbance to soil or vegetation. The term “Permitted Project Disturbance Area” refers only to the solar facility; “linears” includes transmission lines, lay-down areas, pipelines, and access roads.

The project owner shall implement the following measures in sections A, B, C, and D to avoid, minimize, and compensate for direct, indirect, and cumulative impacts to special-status plant species:

### **SECTION A: SPECIAL-STATUS PLANT IMPACT AVOIDANCE AND MINIMIZATION MEASURES**

To protect all special-status plants<sup>34</sup>located outside of the Project Disturbance Area and within 100 feet of the Permitted Project Disturbance Area from accidental and indirect impacts during site mobilization construction, operation, and closure, the project owner shall implement the following measures:

1. Designated Botanist. An experienced botanist who meets the qualifications described in section B-2 below shall oversee compliance with all special-status plant avoidance, minimization, and compensation measures described in this condition throughout construction and closure. The designated botanist shall oversee and train all other biological monitors tasked with conducting botanical survey and monitoring work. During operation of the project, the Designated Biologist shall be responsible for protecting special-status plant occurrences within 100 feet of the project boundaries.
2. Special-Status Plant Impact Avoidance and Minimization Measures. The project owner shall incorporate all measures for protecting special-status plants in close proximity to the site into the BRMIMP (**BIO-7**). These measures shall include the following elements:
  - a. Site Design Modifications: Section i) incorporates modifications to site design or construction techniques to minimize direct and indirect impacts to special-status plants along the project linears to include limiting the width of the work area, adjusting the location of staging areas, lay downs, spur roads and poles or towers, driving and crushing vegetation as an alternative to blading temporary roads to preserve the seed bank, and minor adjustments to the alignment of the roads and pipelines within the constraints of the

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<sup>3</sup> This shall include special-status plants found during the fall 2010 surveys and the following species found during the spring 2009-2010 surveys: Harwood's milkvetch; Harwood's woollystar; California ditaxis; ribbed cryptantha, and the "Palen Lake atriplex (Andre sp. nov.).

<sup>4</sup> Staff defines special-status plants as described in *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* (California Natural Resources Agency, Department of Fish and Game, issued November 24, 2009). "List 3 plants may be analyzed under CEQA §15380 if sufficient information is available to assess potential impacts to such plants. Factors such as regional rarity vs. statewide rarity should be considered in determining whether cumulative impacts to a List 4 plant are significant even if individual project impacts are not."

ROW, section ii) these modifications shall be clearly depicted on the grading and construction plans, and on report-sized maps in the BRMIMP.

- b. Establish Environmentally Sensitive Areas (ESAs). Prior to the start of any ground- or vegetation-disturbing activities, the designated botanist shall establish ESAs to protect avoided<sup>5</sup> special-status plants located outside of the Project Disturbance Areas and within 100 feet of the boundary of construction. This includes plant occurrences identified during the all spring and late season surveys previously conducted. The locations of ESAs shall be clearly depicted on construction drawings, which shall also include all avoidance and minimization measures on the margins of the construction plans. The boundaries of the ESAs shall be placed a minimum of 20 feet from the uphill side of the occurrence and 10 feet from the downhill side. Where this is not possible due to construction constraints, other protection measures such as silt-fencing and sediment controls may be employed to protect the occurrences. Equipment and vehicle maintenance areas and wash areas shall be located 100 feet from the uphill side of any ESAs. ESAs shall be clearly delineated in the field with temporary construction fencing and signs prohibiting movement of the fencing or sediment controls under penalty of work stoppages and additional compensatory mitigation. ESAs shall also be clearly identified (with signage or by mapping on-site plans) to ensure that avoided plants are not inadvertently harmed during construction, operation, or closure.
- c. Special-Status Plant Worker Environmental Awareness Program (WEAP). The WEAP (**BIO-6**) shall include training components specific to protection of special-status plants as outlined in this condition.
- d. Herbicide and Soil Stabilizer Drift Control Measures. Special-status plant occurrences within 100 feet of the Project Disturbance Area and any occurrences avoided within the Project Disturbance Area<sup>3</sup> shall be protected from herbicide and soil stabilizer drift. The Weed Management Plan (**BIO-14**) shall include measures to avoid chemical drift or residual toxicity to special-status plants consistent with guidelines such as those provided by the Nature

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<sup>5</sup> "Avoided" includes plants occurring within 100 feet outside of the project boundary, and all plants within the Project Disturbance Area (linears or solar facility) that were avoided pursuant to section C of this condition.

Conservancy's *The Global Invasive Species Team*<sup>6</sup>, the U.S. Environmental Protection Agency, and the Pesticide Action Network Database<sup>7</sup>.

- e. Erosion and Sediment Control Measures. Erosion and sediment control measures shall not inadvertently impact special-status plants by using invasive or non-native plants in seed mixes, introducing pest plants through contaminated seed or straw, accidental burial by mulches, etc. These specifications shall be incorporated in the Drainage, Erosion, and Sedimentation Control Plan required under **Soil&Water-1**.
- f. Locate Staging, Parking, Spoils, and Storage Areas Away from Special-Status Plant Occurrences. Areas for spoils, equipment, vehicles, and materials storage areas; parking; equipment and vehicle maintenance areas; and wash areas shall be placed at least 100 feet from any ESAs. These specifications shall be incorporated in the Drainage, Erosion, and Sedimentation Control Plan required under **Soil&Water-1**.
- g. Pre-Construction Seed Collection. For all significant impacts to special-status plants, mitigation shall include seed collection from the affected special-status plants population on site prior to construction to conserve the germ plasm and provide a seed source for restoration efforts. Seed collection shall follow the guidelines described in section D.III.3 of this condition.
- h. Monitoring and Reporting Requirements. The designated botanist, or biological monitor under supervision of the designated botanist, shall conduct weekly monitoring of the ESAs that protect special-status plant occurrences during construction and closure activities.

## **SECTION B: CONDUCT LATE-SEASON BOTANICAL SURVEYS**

The project owner shall conduct late-summer/fall botanical surveys for late-season special-status plants prior to start of construction or by the end of 2013, as described below:

1. Survey Timing. Surveys shall be timed to detect a) summer annuals triggered to germinate by the warm, tropical summer storms (which

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<sup>6</sup> Hillmer, J. & D. Liedtke. 2003. Safe Herbicide Handling: A Guide For Land Stewards And Volunteer Stewards. Ohio Chapter, The Nature Conservancy, Dublin, OH. 20 pp. Online: <<http://www.invasive.org/gist/products.html>>

<sup>7</sup> Pesticide Action Network of North America. Kegley, S.E., Hill, B.R., Orme S., Choi A.H., PAN Pesticide Database, Pesticide Action Network, North America. San Francisco, CA, 2010 <<http://www.pesticideinfo.org>>

may occur any time between June and October), and b) fall-blooming perennials that respond to the cooler, later season storms (typically beginning in September or October). For those species that are identified by vegetative characteristics, surveys do not have to be timed for blooming or fruiting. The surveys shall not be timed to coincide with the statistical peak bloom period of the target species but shall instead, if possible, be based on plant phenology and the timing of a significant storm event (e.g., a 10 mm or greater rain or multiple storm events of sufficient volume to trigger germination as determined by a qualified botanist). If possible, surveys shall occur at the appropriate time to capture the characteristics necessary to identify the taxon. Construction is authorized to commence following a 2013 late season survey.

2. Surveyor Qualifications and Training. Surveys shall be conducted by a qualified botanist knowledgeable in the complex biology of the local flora, and consistent with CDFG (2009) and the BLM (2009) guidelines for surveyor qualifications. Each surveyor shall be equipped with a GPS unit and record a complete tracklog; these data shall be compiled and submitted along with the Summer-Fall Survey Botanical Report (described below). Prior to the start of surveys, all crew members shall, at a minimum, visit reference sites (where available) and/or review herbarium specimens of all BLM sensitive plants, California Rare Plant Rank (RPR) 1B or 2 (Nature Serve Rank S1 and S2) or proposed RPR 1B or 2 taxa, and any new reported or documented taxa, to obtain a search image. Because the potential for range extensions is unknown, the list of potentially occurring special-status plants shall include all special-status taxa known to occur within the Sonoran Desert region and the eastern portion of the Mojave Desert in California. The list shall also include taxa with bloom seasons that begin in fall and extend into the early spring as many of these are reported to be easier to detect in fall following the start of the fall rains.
3. Survey Coverage. The survey coverage or intensity shall be in accordance with most recent BLM Survey Protocols (currently issued July 2009)<sup>8</sup>, which specify that intuitive controlled surveys shall only be accomplished by botanists familiar with the habitats and species that may reasonably be expected to occur in the project area.
4. Pre-Construction Seed Collection. For all significant impacts to special-status plants, mitigation shall include seed collection from the affected

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<sup>8</sup> BLM, California State Office. *Survey Protocols Required for NEPA/ESA Compliance for BLM Special Status Plant Species*, issued July 2009.

special-status plants population on site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. Seed collection shall be conducted during the late-season surveys following the guidelines described in section D.III.3 of this condition.

5. Documenting Occurrences. If a special-status plant is detected, the full extent of the population on site shall be recorded using GPS in accordance with the BLM survey protocols. Additionally, the extent of the population within one mile of project boundaries shall be assessed at least qualitatively to facilitate an accurate estimation of the proportion of the population affected by the project. For populations that are very dense or very large, the population size may be estimated by simple sampling techniques. When populations are very extensive or locally abundant, the surveyor must provide some basis for this assertion and roughly map the extent on a topographic map. All but the smallest populations (e.g., a population occupying less than 100 square feet) shall be recorded as area polygons; the smallest populations may be recorded as point features. All GPS-recorded occurrences shall include the number of plants, phenology, observed threats (e.g., OHV or invasive exotics), and habitat or community type. The map of occurrences submitted with the final botanical report shall be prepared to ensure consistency with definition of an occurrence by CNDDDB, i.e., occurrences found within 0.25 miles of another occurrence of the same taxon, and not separated by significant habitat discontinuities, shall be combined into a single "occurrence." The project owner shall also submit the raw GPS shape files and metadata, and completed CNDDDB forms for each "occurrence" (as defined by CNDDDB).
6. Reporting. Raw GPS data, metadata, and CNDDDB field forms shall be provided to the CPM and the BLM State Botanist within four weeks of the completion of each survey. If surveys are split into two or more periods (e.g., a late summer survey and a fall survey), then a summary letter shall be submitted following each survey period.

The Final Summer-Fall Botanical Survey Report shall be prepared consistent with CDFW guidelines (currently CDFG 2009), and currently the BLM 2009 guidelines (or the most recent version of CDFW and the BLM guidelines) and shall include all of the following components:

- a. The BLM designation, NatureServe Global and S Rank of each species or taxon found (or proposed rank, or CNPS List);

- b. The number or percent of the occurrence that will be directly affected and indirectly affected by changes in drainage patterns or altered geomorphic processes;
- c. The habitat or plant community that supports the occurrence and the total acres of that habitat or community type that occurs in the Project Disturbance Area;
- d. An indication of whether the occurrence has any local or regional significance (e.g., if it exhibits any unusual morphology, occurs at the periphery of its range in California, represents a significant range extension or disjunct occurrence, or occurs in an atypical habitat or substrate);
- e. A completed CNDDDB field form for every occurrence (occurrences of the same species within one-quarter mile or less of each other combined as one occurrence, consistent with CNDDDB methodology); and
- f. Two maps one that depicts the raw GPS data (as collected in the field) on a topographic base map with project features, and a second map that follows the CNDDDB protocol for occurrence mapping.

### **SECTION C: AVOIDANCE REQUIREMENTS FOR SPECIAL-STATUS PLANTS DETECTED IN THE SUMMER/FALL 2013 SURVEYS**

The project owner shall apply the following avoidance and mitigation standards for impacts to late blooming special-status plants that might be detected during late summer/fall season surveys. The project owner shall immediately notify the the BLM, USFWS, the State Botanist, CDFW, and the CPM if any state- or federal-listed species or the BLM sensitive species are detected. Avoidance and/or the off-site mitigation measures described in section D below would reduce impacts to these special-status plant species to less-than-significant levels. Plants shall be considered impacted if they are within the project footprint, or if they would be affected by project-related hydrologic changes, or changes to the local sand transport system. Downstream/downwind impacts from altered hydrology or geomorphic processes shall be considered direct impacts.

Mitigation for CNDDDB S Rank 1 Plants (Critically Imperiled). If late blooming species with a CNDDDB S Rank of 1<sup>9</sup> are detected within the

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<sup>9</sup> The CNDDDB State Rank is provided in the California Natural Diversity Database (CNDDDB) is a Natural Heritage rank that is generated using a rank calculator from the Heritage program, and in California this ranking process is managed by CNDDDB and refers to the imperilment status only within California's state boundaries. Plants with a Rank of 1 are "Critically imperiled in the nation or state/province because of

Project Disturbance Area, complete avoidance is mandatory along the linears and within construction lay-down areas. The project owner shall limit the width of the work area adjusting the location of staging areas, lay downs, spur roads and poles or towers, driving and crushing vegetation as an alternative to blading temporary roads, and other construction or design modifications as necessary to achieve avoidance of any S Rank 1 plants detected.

If late-season S Rank 1 plants are detected on the solar facility, the project owner shall avoid all plants around the perimeter<sup>10</sup> of the facility as necessary to achieve 75 percent avoidance of the local population of the affected species. The local population shall be measured by the number of individuals occurring on the project site and within the immediate watershed of the project for wash dependent-species or species of unknown dispersal mechanism, or within the local sand transport corridor for wind dispersed species. Measurement of percent avoidance shall be based on population for perennials and on habitat for annuals (habitat containing the species' micro-habitat preferences such as "fine silts and moist depressions"). Avoidance within the central portion of the solar facility is not recommended because it would create fragmented conditions that would not sustain persistence of the affected species. For all portions of the local population not avoided, the project owner shall implement off-site mitigation at a ratio of 3:1. The off-site mitigation may include land acquisition or implementation of a restoration/enhancement program for the species, and shall meet the performance standards described in section D of this condition. The Applicant must demonstrate, subject to review and approval by the CPM, that the impacts after mitigation will not cause a loss of viability<sup>11</sup> for that species. The project owner shall prepare and implement a Special-Status Plant Mitigation Plan (Plan). The content of the Plan and definitions shall be as described above in subsection C.3 below.

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extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state."

<sup>10</sup> The inside "perimeter" is used here to describe the distance or length equal to two troughs.

<sup>11</sup> A "viable" species is one consisting of self-sustaining and interacting populations that are well-distributed throughout the species' range. "Self-sustaining populations" are those that are sufficiently abundant and have sufficient diversity to display the array of life history strategies and forms to provide for their long-term persistence and adaptability over time. The definition of the term "well-distributed" can vary based on current, historic, and potential population and habitat conditions. Maintaining viability is a means of ensuring, as much as possible, that a species will not go extinct in the foreseeable future. Because species and their environments are dynamic, there is not a single population size above which a species is viable and below which it will become extinct. Viability is best expressed as a level of risk of extinction.

1. Mitigation for CNDDDB S Rank 2<sup>12</sup> Plants (Imperiled). If late-season CNDDDB S Rank 2 Plants are detected within the Project Disturbance Area, avoidance is mandatory along the linears unless such avoidance would cause disturbance to areas not previously surveyed for biological resources or would create greater environmental impacts in all other disciplines (e.g. Cultural Resource Sites) or other restrictions (e.g., FAA or other restrictions for placement of transmission poles), except for the known population of California ditaxis. The project owner shall provide compensatory mitigation, at a ratio of 2:1, as described below in section D for impacts to S Rank 2 plants that could not be avoided. Complete avoidance is mandatory on construction lay-down areas. The project owner shall limit the width of the work area, adjusting the location of staging areas, lay-downs, spur roads and poles or towers, driving and crushing vegetation as an alternative to blading temporary roads, and other construction or design modifications as necessary to achieve avoidance of any S Rank 2 plants detected<sup>13</sup>.

If late-season S Rank 2 plants are detected on the solar facility, the project owner shall implement off-site mitigation at a ratio of 2:1 for any impacts exceeding 25 percent of the local population. The off-site mitigation may include land acquisition or implementation of a restoration/enhancement program for the species, and shall meet the performance standards described in section D of this condition. The project owner must demonstrate, subject to review and approval by the CPM, that the impacts, after mitigation, will not cause a loss of viability for that species. The project owner shall prepare and implement a Plan. The content of the Plan and definitions shall be as described above in subsection C.3 below.

2. Mitigation for CNDDDB S Rank 3<sup>14</sup> Plants (Vulnerable). If CNDDDB S Rank 3 plants are detected (which constitutes most RPR 4 plants), mitigation is not required unless the occurrence has local or regional

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<sup>12</sup> CNDDDB S Rank 2 plants are “Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state”.

<sup>13</sup> The CNDDDB S Rank 2 plants California ditaxis was detected along the linears within the Project Disturbance Area (Solar Millenium 2010p). Staff concluded the impact was significant and all terms and conditions of section C.2 shall be implemented. Staff concluded that the direct impacts to Harwood’s milkvetch were minor and no compensatory mitigation is required beyond the avoidance and minimization measures described in Section A of this condition.

<sup>14</sup> CNDDDB S Rank 3 plants are “Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

significance, in which case the plant occurrence shall be treated as a CNDDDB S Rank 2 plant; avoidance and mitigation would be as described above under C.2. A plant occurrence would be considered to have local or regional significance if:

- a. it occurs at the outermost periphery of its range in California;
- b. it occurs in an atypical habitat, region, or elevation for the taxon that suggests that the occurrence may have genetic significance (e.g., that may increase its ability to survive future threats); or
- c. it exhibits any unusual morphology that is not clearly attributable to environmental factors that may indicate a potential new variety or sub-species.

3. Prepare Special-Status Plant Mitigation Plan. If the project will impact any CNDDDB S Rank 1 or S Rank 2 plants, or S Rank 3 plants of local or regional significance, or new taxa, the project owner shall prepare and implement a Plan. Compensatory mitigation, as described in section D of this condition, and at a mitigation ratio of 3:1 for S Rank 1 plants, and 2:1 for S Rank 2 plants and S Rank 1 plants of local or regional significance, and new taxa. The Plan shall include, at a minimum, the following components and definitions:

- a. A description of the occurrences of the affected special-status species, ecological characteristics such as soil, hydrology, and other micro-habitat requirements, ecosystem processes required for maintenance of the species or its habitat, reproduction and dispersal mechanisms, pollinators, local distribution, a description of the extent of the population off site, the percentage of the local population affected, and a description of how these occurrences would be impacted by the project, including direct and indirect effects. Occurrences shall be considered impacted if they are within the project footprint, and if they would be affected by project-related hydrologic changes or changes to the local sand transport system.
- b. A description of the avoidance and minimization measures that would achieve complete avoidance of occurrences on the project linears and construction lay-down areas. If avoidance is also required on the solar facility (S Rank 1 species), provide a description of the measures that would be implemented to avoid or minimize impacts to occurrences on the solar facility. "Avoidance" shall include protection of the ecosystem processes essential for maintenance of the protected plant occurrence, and protection of the seed bank. Isolated "islands" of protected plants disconnected by the project from natural fluvial, aeolian (wind), or other

processes essential for maintenance of the species, shall not be considered avoidance.

- c. If off-site mitigation is also required, pursuant to C.1–C.3 above, the Plan shall include a description of the proposed mitigation (acquisition or restoration/enhancement) and demonstrate how the mitigation will meet the performance standards described in section D of this condition.

For CNDDDB S Rank 1 plants that cannot be avoided (i.e., plants located in the central portion of the solar facility), the Plan must demonstrate that the impacts (after mitigation) will not cause a loss of viability for that species. The assessment of viability shall include 1) current literature compilation and review on the affected species, its documented and reported occurrences, range and distribution, habitat, and the ecological conditions needed to support it; 2) consultation with scientists and others with expertise and local knowledge of the species to gather unpublished data and other information to supplement the literature review findings; and (if available) 3) information on species' habitat relationships, demographics, genetics, and risk factors.

#### **SECTION D: OFF-SITE COMPENSATORY MITIGATION FOR SPECIAL-STATUS PLANTS**

Where compensatory mitigation is required under the terms of section C, above, the project owner shall mitigate project impacts to special-status plant occurrences with compensatory mitigation. Compensatory mitigation shall consist of acquisition of habitat supporting the target species, or restoration/enhancement of populations of the target species, and shall meet the performance standards for mitigation described below. In the event that no opportunities for acquisition or restoration/enhancement exist, the project owner can fund a species distribution study designed to promote the future preservation, protection or recovery of the species. Compensatory mitigation shall be at a ratio of 3:1 for S Rank 1 plants, with three acres of habitat acquired or restored/enhanced for every acre of habitat occupied by the special status plant that will be disturbed by the Project Disturbance Area (for example if the area occupied by the special status plant collectively measured is  $\frac{1}{4}$  acre, then the compensatory mitigation will be  $\frac{3}{4}$  of an acre). The mitigation ratio for S Rank 2 plants shall be 2:1. So, for the example above, the mitigation ratio would be one-half acre for the S Rank 2 plants.

The project owner shall provide funding for the acquisition and/or restoration/enhancement, initial improvement, and long-term maintenance

and management of the acquired or restored lands. The actual costs to comply with this condition will vary depending on the Project Disturbance Area, the actual costs of acquiring compensation habitat, the actual costs of initially improving the habitat, the actual costs of long-term management as determined by a PAR report, and other transactional costs related to the use of compensatory mitigation.

The project owner shall comply with other related requirements in this condition:

**I. Compensatory Mitigation by Acquisition:** The requirements for the acquisition, initial protection and habitat improvement, and long-term maintenance and management of special-status plant compensation lands include all of the following:

1. Selection Criteria for Acquisition Lands. The compensation lands selected for acquisition may include any of the following three categories:
  - a. Occupied Habitat, No Habitat Threats. The compensation lands selected for acquisition shall be occupied by the target plant population and shall be characterized by site integrity and habitat quality that are required to support the target species, and shall be of equal or better habitat quality than that of the affected occurrence. The occurrence of the target special-status plant on the proposed acquisition lands should be viable, stable or increasing (in size and reproduction).
  - b. Occupied Habitat, Habitat Threats. Occupied compensation lands characterized by habitat threats may also be acquired as long as the population could be reasonably expected to recover with habitat restoration efforts (e.g., OHV or grazing exclusion, or removal of invasive non-native plants) and is accompanied by a Habitat Enhancement/Restoration Plan as described in section D.II below.
  - c. Unoccupied/Adjacent. The project owner may also acquire habitat for which occupancy by the target species has not been documented, if the proposed acquisition lands are adjacent to occupied habitat. The project owner shall provide evidence that acquisitions of such unoccupied lands would improve the defensibility and long-term sustainability of the occupied habitat by providing a protective buffer around the occurrence and by enhancing connectivity with undisturbed habitat. This acquisition may include habitat restoration efforts where appropriate, particularly when these restoration efforts will benefit adjacent habitat that is occupied by the target species.

2. Review and Approval of Compensation Lands Prior to Acquisition. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands for special-status plants in relation to the criteria listed above, and must be approved by the CPM.
3. Compensation Lands Mitigation Management Plan. The project owner or approved third party shall prepare a management plan for the compensation lands in consultation with the entity that will be managing the lands. The goal of the management plans shall be to support and enhance the long-term viability of the target special-status plant occurrences. The management plan shall be submitted for review and approval to the CPM.
4. Integrating Special-Status Plant Mitigation with Other Mitigation Lands. If all or any portion of the acquired Desert Tortoise, waters of the state, or other required compensation lands meet the criteria above for special-status plant compensation lands, the portion of the other species' or habitat compensation lands that meets any of the criteria above may be used to fulfill that portion of the obligation for special-status plant mitigation.
5. Compensation Lands Acquisition Requirements. The project owner shall comply with the following requirements relating to acquisition of the compensation lands after the CPM, has approved the proposed compensation lands:
  - a. Preliminary Report. The project owner, or an approved third party, shall provide a recent preliminary title report, initial hazardous materials survey report, biological analysis, and other necessary or requested documents for the proposed compensation land to the CPM. All documents conveying or conserving compensation lands and all conditions of title are subject to review and approval by the CPM. For conveyances to the state, approval may also be required from the California Department of General Services, the Fish and Game Commission and the Wildlife Conservation Board.
  - b. Title/Conveyance. The project owner shall acquire and transfer fee title to the compensation lands, a conservation easement over the lands, or both fee title and conservation easement, as required by the CPM. Any transfer of a conservation easement or fee title must be to CDFW, a nonprofit organization qualified to hold title to and manage compensation lands (pursuant to California Government Code, section 65965), or to the BLM or other public agency

approved by the CPM. If an approved nonprofit organization holds fee title to the compensation lands, a conservation easement shall be recorded in favor of CDFW or another entity approved by the CPM. If an entity other than CDFW holds a conservation easement over the compensation lands, the CPM may require that CDFW or another entity approved by the CPM, in consultation with CDFW, be named a third party beneficiary of the conservation easement. The project owner shall obtain approval of the CPM of the terms of any transfer of fee title or conservation easement to the compensation lands.

- c. Initial Protection and Habitat Improvement. The project owner shall fund activities that the CPM requires for the initial protection and habitat improvement of the compensation lands. These activities will vary depending on the condition and location of the land acquired, but may include trash removal, construction and repair of fences, invasive plant removal, and similar measures to protect habitat and improve habitat quality on the compensation lands. The costs of these activities would use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for S Rank 1 plants and 2:1 for S Rank 2 plants, but actual costs will vary depending on the measures that are required for the compensation lands. A nonprofit organization, CDFW or another public agency may hold and expend the habitat improvement funds if it is qualified to manage the compensation lands (pursuant to California Government Code, section 65965), if it meets the approval of the CPM in consultation with CDFW, and if it is authorized to participate in implementing the required activities on the compensation lands. If CDFW takes fee title to the compensation lands, the habitat improvement fund must be paid to CDFW or its designee.
- d. Property Analysis Record. Upon identification of the compensation lands, the project owner shall conduct a PAR or PAR-like analysis to establish the appropriate amount of the long-term maintenance and management funds to pay the in-perpetuity management of the compensation lands. The PAR or PAR-like analysis must be approved by the CPM before it can be used to establish funding levels or management activities for the compensation lands.
- e. Long-term Maintenance and Management Funding. The project owner shall deposit in the REAT account, or other CPM approved entity, a capital long-term maintenance and management fee in the

amount determined through the PAR or PAR-like analysis conducted for the compensation lands.

The CPM, in consultation with CDFW, may designate another nonprofit organization to hold the long-term maintenance and management fee if the organization is qualified to manage the compensation lands in perpetuity. If CDFW takes fee title to the compensation lands, CDFW shall determine whether it will hold the long-term management fee in the special deposit fund, leave the money in the REAT account, or designate another entity to manage the long-term maintenance and management fee for CDFW and with CDFW supervision.

Interest, Principal, and Pooling of Funds. The project owner shall ensure that an agreement is in place with the long-term maintenance and management fund (endowment) holder/ manager to ensure the following requirements are met:

Interest. Interest generated from the initial capital long-term maintenance and management fund shall be available for reinvestment into the principal and for the long-term operation, management, and protection of the approved compensation lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action that is approved by the CPM and is designed to protect or improve the habitat values of the compensation lands.

Withdrawal of Principal. The long-term maintenance and management fund principal shall not be drawn upon unless such withdrawal is deemed necessary by the CPM or by the approved third-party long-term maintenance and management fund manager, to ensure the continued viability of the species on the compensation lands.

- i. Pooling Long-Term Maintenance and Management Funds. An entity approved to hold long-term maintenance and management funds for the project may pool those funds with similar funds that it holds from other projects for long-term maintenance and management of compensation lands for special-status plants. However, for reporting purposes, the long-term maintenance and management funds for this project must be tracked and reported individually to the CPM.

- f. Other Expenses. In addition to the costs listed above, the project owner shall be responsible for all other costs related to acquisition of compensation lands and conservation easements, including but not limited to the title and document review costs incurred from other state agency reviews, overhead related to providing compensation lands to CDFW or an approved third party, escrow fees or costs, environmental contaminants clearance, and other site cleanup measures.
- g. Mitigation Security. The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement any of the mitigation measures required by this condition that are not completed prior to the start of ground-disturbing project activities. Financial assurances shall be provided to the CPM in the form of an irrevocable letter of credit, a pledged savings account or another form of Security approved by the CPM. The amount of the Security shall use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at a ratio of 3:1 for S Rank 1 plants and 2:1 for S Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is significantly impacted by the project. The actual costs to comply with this condition will vary depending on the actual costs of acquiring compensation habitat, the costs of initially improving the habitat, and the actual costs of long-term management as determined by a PAR report. Prior to submitting the Security to the CPM, the project owner shall obtain the CPM's approval of the form of the Security. The CPM may draw on the Security if the CPM determines the project owner has failed to comply with the requirements specified in this condition. The CPM may use money from the Security solely for implementation of the requirements of this condition. The CPM's use of the Security to implement measures in this condition may not fully satisfy the project owner's obligations under this condition, and the project owner remains responsible for satisfying the obligations under this condition if the Security is insufficient. The unused Security shall be returned to the project owner in whole or in part upon successful completion of the associated requirements in this condition.
- h. REAT Account. The project owner may elect to comply with the requirements in this condition for acquisition of compensation lands, initial protection and habitat improvement on the compensation lands, or long-term maintenance and management of the compensation lands by funding, or any combination of these

three requirements, by providing funds to implement those measures into the REAT account. To use this option, the project owner must make an initial deposit to the REAT account in an amount equal to the estimated costs (as set forth in the Security section of this condition) of implementing the requirement. If the actual cost of the acquisition, initial protection and habitat improvements, or long-term funding is more than the estimated amount initially paid by the project owner, the project owner shall make an additional deposit into the REAT account sufficient to cover the actual acquisition costs, the actual costs of initial protection and habitat improvement on the compensation lands, and the long-term funding requirements as established in an approved PAR or PAR-like analysis. If those actual costs or PAR projections are less than the amount initially transferred by the Applicant, the remaining balance shall be returned to the project owner.

The responsibility for acquisition of compensation lands may be delegated to a third party, such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM, in consultation with the BLM, USFWS, and CDFW, prior to land acquisition, enhancement or management activities. Agreements to delegate land acquisition to an approved third party, or to manage compensation lands, shall be executed and implemented within 18 months of the start of ground disturbance.

## **II. Compensatory Mitigation by Habitat Enhancement/ Restoration:**

As an alternative or adjunct to land acquisition for compensatory mitigation, the project owner may undertake habitat enhancement or restoration for the target special-status plant species. Habitat enhancement or restoration activities must achieve protection at a 3:1 ratio for S Rank 1 plants and 2:1 for S Rank 2 plants, with improvements applied to three acres, or two acres, respectively, of habitat for every acre of special-status plant habitat directly or indirectly disturbed by the Project Disturbance Area (for example if the area occupied by the special status plant collectively measured is 1/4 acre then the improvements would be applied to an area equal to 3/4 of an acre at a 3:1 ratio, or one-half acre at a 2:1 ratio). Examples of suitable enhancement projects include, but are not limited to, the following: i) control unauthorized vehicle use into an occurrence (or pedestrian use if clearly damaging to the species); ii) control of invasive non-native plants that infest or pose an immediate

threat to an occurrence; iii) exclude grazing by wild burros or livestock from an occurrence; or iv) restore lost or degraded hydrologic or geomorphic functions critical to the species by restoring previously diverted flows, removing obstructions to the wind sand transport corridor above an occurrence, or increasing groundwater availability for dependent species.

If the project owner elects to undertake a habitat enhancement project for mitigation, the project must meet the following performance standards. The proposed enhancement project shall achieve rescue of an off-site occurrence that is currently assessed, based on the NatureServe threat ranking system<sup>15</sup> with one of the following threat ranks: a) long-term decline >30%; b) an immediate threat that affects >30% of the population, or c) has an overall threat impact that is High to Very High. "Rescue" would be considered successful if it achieves an improvement in the occurrence trend to "stable" or "increasing" status, or downgrading of the overall threat rank to slight or low (from "High" to "Very High").

If the project owner elects to undertake a habitat enhancement project for mitigation, the project owner shall submit a Habitat Enhancement/Restoration Plan to the CPM for review and approval, and shall provide sufficient funding for implementation and monitoring of the Plan. The amount of the Security shall use the estimated cost per acre for Desert Tortoise mitigation as a best available proxy, at the ratio of 3:1 for S Rank 1 plants and 2:1 for S Rank 2 plants, for every acre of habitat supporting the target special-status plant species which is directly or indirectly impacted by the project. The amount of the Security may be adjusted based on the actual costs of implementing the enhancement, restoration and monitoring. The implementation and monitoring of the enhancement/restoration may be undertaken by an appropriate third party subject to approval by the CPM. The Habitat Enhancement/Restoration Plan shall include each of the following:

1. Goals and Objectives. Define the goals of the restoration or enhancement project and a measurable course of action developed to achieve those goals. The objective of the proposed habitat enhancement plan shall include restoration of a target special-status

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<sup>15</sup> Master, L., D. Faber-Langendoen, R. Bittman, G. A., Hammerson, B. Heidel, J. Nichols, L. Ramsay, and A. Tomaino. 2009. *NatureServe Conservation Status Assessments: Factors for Assessing Extinction Risk*. NatureServe, Arlington, VA. Online: [http://www.natureserve.org/publications/ConsStatusAssess\\_StatusFactors.pdf](http://www.natureserve.org/publications/ConsStatusAssess_StatusFactors.pdf), "Threats". See also: Morse, L.E., J.M. Randall, N. Benton, R. Hiebert, and S. Lu. 2004. *An Invasive Species Assessment Protocol: Evaluating Non-Native Plants for Their Impact on Biodiversity*. Version 1. NatureServe, Arlington, Virginia. Online: <http://www.natureserve.org/publications/pubs/invasiveSpecies.pdf>

plant occurrence that is currently threatened with a long-term decline. The proposed enhancement plan shall achieve an improvement in the occurrence trend to “stable” or “increasing” status, or downgrading of the overall threat rank to Slight or Low (from “High” to “Very High”).

2. Historical Conditions. Provide a description of the pre-impact or historical conditions (before the site was degraded by weeds or grazing or ORV, etc.), and the desired conditions.
3. Site Characteristics. Describe other site characteristics relevant to the restoration or enhancement project (e.g., composition of native and pest plants, topography and drainage patterns, soil types, geomorphic and hydrologic processes important to the site or species).
4. Ecological Factors. Describe other important ecological factors of the species being protected, restored, or enhanced such as total population, reproduction, distribution, pollinators, etc.
5. Methods. Describe the restoration methods that will be used (e.g., invasive exotics control, site protection, seedling protection, propagation techniques, etc.) and the long-term maintenance required. The implementation phase of the enhancement must be completed within five years.
6. Budget. Provide a detailed budget and time-line, and develop clear, measurable, objective-driven annual success criteria.
7. Monitoring. Develop clear, measurable monitoring methods that can be used to evaluate the effectiveness of the restoration and the benefit to the affected species. The Plan shall include a minimum of five years of quarterly monitoring, and then annual monitoring for the remainder of the enhancement project, and until the performance standards for rescue of a threatened occurrence are met. At a minimum the progress reports shall include: quantitative measurements of the projects progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed and contact information for the responsible parties.
8. Reporting Program. The Plan shall ensure accountability with a reporting program that includes progress toward goals and success criteria. Include names of responsible parties.
9. Contingency Plan. Describe the contingency plan for failure to meet annual goals.
10. Long-term Protection. Include proof of long-term protection for the restoration site. For private lands this would include conservations

easements or other deed restrictions; projects on public lands must be contained in a DWMA, WHMA, or other land use protections that will protect the mitigation site and target species.

### **III. Contingency Measures**

1. Preservation of the Germplasm of Affected Special-Status Plants.  
For all significant impacts to special-status plants, mitigation shall also include seed collection from the affected special-status plants population on site prior to construction to conserve the germplasm and provide a seed source for restoration efforts. The seed shall be collected under the supervision or guidance of a reputable seed storage facility such as the Rancho Santa Ana Botanical Garden Seed Conservation Program, San Diego Natural History Museum, or the Missouri Botanical Garden. The costs associated with the long-term storage of the seed shall be the responsibility of the project owner. Any efforts to propagate and reintroduce special-status plants from seeds in the wild shall be carried out under the direct supervision of specialists such as those listed above and as part of a Habitat Restoration/Enhancement Plan approved by the CPM.
2. Compensatory Mitigation by Conducting or Contributing to a Management Plan for the Affected Species. Subject to approval of the CPM, as a contingency measure in the event there are no opportunities for mitigation through acquisition or restoration/enhancement to meet the obligations for off-site mitigation as described in section C.1-3 of this condition, , a management plan for the affected special-status plant species may be conducted or funded. The goal of the Affected Species Management Plan is to devise a science-based, region-wide strategy to ensure the long-term viability of the affected species, and to acquire, protect, and restore existing populations and the habitat that supports them. The information gathered shall be used to develop conservation approaches to address the identified risk factors. These approaches include land allocations, restoration needs, identifying and preserving important refugia to facilitate species dispersal and maintain biodiversity in the face of climate change, recommending BMP or other measures that could be used to minimize threats, and identifying planning needs at the regional level. The results of the study would also be provided to the resource agencies, conservation organizations, and academic institutions, as well as the state's Natural Diversity Database and Consortium of California Herbaria.

3. Under this contingency measure, the project owner shall acquire all available information on the distribution, status or health of known occurrences, ecological requirements, and ownership and management opportunities of the affected special-status plant species and other special status plants known to occur in the Chuckwalla Valley. Some of these late blooming species are only known from a few viable occurrences in California, and historic occurrences that have not been re-located or surveyed since they were first documented. At a minimum, the study shall include the following:
  - a. Occurrence and Life History Review. The Study shall include an evaluation of all documented, historical and reported localities for the affected species, and a review of current information on the species life history. This would include a review of the CNDDDB database, records from regional and national herbaria, literature review, consultation with U.C. Riverside, San Diego Natural History Museum, and other educational institutions or natural heritage organizations in California, Arizona, and Nevada, etc., other biotechnical survey reports from the region, and information from regional botanical experts.
  - b. Conduct Site Visits to Documented and Reported Localities. Documented and reported occurrences would be evaluated in the field during the appropriate time of the year for each late blooming species. If located, these occurrences would be evaluated for population size (area and quantity), population trend, ecological characteristics, soils, habitat quality, potential threats, degree and immediacy of threats, ownership and management opportunities. GPS location data would also be collected during these site visits.
  - c. Survey Surrounding Areas. Areas surrounding the occurrences that contain habitat suitable to support the affected species shall be surveyed to determine the full extent of its range and distribution. If additional populations are found, collect data (GPS and assessment) on these additional populations consistent with III.2 above.
  - d. Prepare Report on Status, Distribution, and Management Needs. A report shall be prepared that contains the results of the surveys and assessment. The report shall contain the following components: a) Range and Distribution (including maps and GPS data); b) Abundance and Population Trends; c)

Life History; d) Habitat Necessary for Survival; e) Factors Affecting Ability to Survive and Reproduce; f) Degree and Immediacy of Threat; g) Ownership and Management Opportunities for Protection or Recovery; h) Sources of Information, and i) Conclusions. The conclusions shall contain an explanation of whether the species' survival is threatened by any of the following factors: i) present or threatened modification or destruction of its habitat; ii) competition; iii) disease; and iv) other natural occurrences (such as climate change) or human-related activities. This valuable information will provide a better understanding of the ecological factors driving the distribution of these species, and will identify opportunities for mitigation and management opportunities for recovery. All data from this study will be submitted for incorporation into the CNDDDB system and the study report will be made available to resource agencies, and conservation groups, and other interested parties.

- e. The cost to implement or fund the study shall be no greater than the cost for acquisition, enhancement, and long-term management of compensatory mitigation lands based on the specifications and standards for acquisition or restoration/enhancement described above under D.I and D.II.

**VERIFICATION:** The Special-Status Plant Impact Avoidance and Minimization Measures shall be incorporated into the BRMIMP as required under Condition of Certification **BIO-7**.

The project owner shall notify the CPM and the BLM State Botanist no less than 14 days prior to the start of late-season surveys and provide a target list of late season special-status plants that will be considered. Concurrently, the project owner shall coordinate with the BLM to obtain a permit for seed collection. Seed collection is required for all special-status plants located within the Project Disturbance Area and shall be conducted according to the specifications in section D.III.1 of this condition and with all terms and conditions of the BLM permit.

Raw GPS data, metadata, and CNDDDB field forms shall be submitted to the CPM and the BLM State Botanist within four weeks of the completion of each survey. A preliminary summary of results for the late summer/fall botanical surveys, prepared according to guidelines in section B of this condition, shall also be submitted to the CPM and the BLM's State Botanist within two weeks following the completion of the surveys. If surveys are split into more than one period, then a summary letter shall be submitted following each survey period. The Final Summer-Fall Botanical Survey Report, GIS shape files and metadata shall be submitted to the BLM State Botanist and the CPM no less than 30 days prior to the start of site mobilization and construction activities. The

final report shall include a detailed accounting of the acreage of project impacts to special-status plant occurrences.

For any special-status plant species located within the Project Disturbance Area, the project owner shall submit to the CPM, no less than 30 days prior to the start of site mobilization and construction activities, proof in the form of a letter or receipt of the seed or other propagules collected pursuant to section D.III #1 of this Condition.

The draft conceptual Special-Status Plant Mitigation Plan, as described under section C.4 of this condition, shall be submitted to the CPM for review and approval no less than 30 days prior to the start of site mobilization and construction activities.

The project owner shall immediately provide written notification to the CPM, the BLM, USFWS, the State Botanist, and CDFW if it detects a State- or Federal-Listed Species, or the BLM sensitive species at any time during its late summer/fall botanical surveys or at any time thereafter through the life of the project, including conclusion of project closure .

No less than 30 days prior to the start of ground-disturbing activities the project owner shall submit grading plans and construction drawings to the CPM that depict the location of Environmentally Sensitive Areas and the Avoidance and Minimization Measures contained in section A of this Condition, and under section C.1-3.

If compensatory mitigation is required, pursuant to section C.1-3, no less than 30 days prior to the start of site mobilization and construction activities, the project owner shall submit to the CPM the form of Security adequate to acquire compensatory mitigation lands and/or undertake habitat enhancement or restoration activities, as described in this condition. Actual Security shall be provided seven days prior to start of site mobilization and construction activities.

No fewer than 90 days prior to acquisition of compensatory mitigation lands, the project owner shall submit a formal acquisition proposal and draft management plan for the proposed lands to the CPM, with copies to the BLM, USFWS, and CDFW, describing the parcels intended for purchase and shall obtain approval from the CPM prior to the acquisition. No fewer than 90 days prior to acquisition of compensatory mitigation lands, the project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented within 18 months of the start of ground disturbance.

No fewer than 30 days after acquisition of the property, the project owner shall deposit the funds required by section I e above (long term management and maintenance fee) and provide proof of the deposit to the CPM.

The project owner or an approved third party shall complete the acquisition and all required transfers of the compensation lands, and provide written verification to the CPM of such completion no later than 18 months after the start of site mobilization and

construction activities. If a third party is being used for the acquisition, the project owner shall ensure that funds needed to accomplish the acquisition are transferred in timely manner to facilitate the planned acquisition and to ensure the land can be acquired and transferred prior to the 18-month deadline. If habitat enhancement is proposed, no later than six months following the start of ground-disturbing activities, the project owner shall obtain CPM approval of the final Habitat Enhancement/Restoration Plan, prepared in accordance with section D, and submit it to the CPM or a third party approved by the CPM Security adequate for long-term implementation and monitoring of the Habitat Enhancement/Restoration Plan.

Enhancement/restoration activities shall be initiated no later than 12 months from the start of construction. The implementation phase of the enhancement project shall be completed within five years of initiation. Until completion of the five-year implementation portion of the enhancement action, a report shall be prepared and submitted as part of the Annual Compliance Report. This report shall provide, at a minimum: a summary of activities for the preceding year and a summary of activities for the following year, quantitative measurements of the project's progress in meeting the enhancement project success criteria, detailed description of remedial actions taken or proposed, and contact information for the responsible parties.

If a contingency measure is required as described in section D.III of this condition, the project owner shall submit commence no later than six months following the start of ground-disturbing activities. The draft study shall be submitted to the CPM and the BLM State Botanist for review and approval no more than two years following the start of ground-disturbing activities. The final study shall be submitted no more than 30 months following the start of ground-disturbing activities.

If a distribution study is implemented as contingency mitigation, the study shall be initiated no later than six months from the start of construction. The implementation phase of the study shall be completed within two years of the start of construction.

Within 18 months of site mobilization and construction activities, the project owner shall transfer to the CPM or an approved third party the difference between the Security paid and the actual costs of (1) acquiring compensatory mitigation lands, completing initial protection and habitat improvement, and funding the long-term maintenance and management of compensatory mitigation lands, and/or (2) implementing and providing for the long-term protection and monitoring of habitat enhancement or restoration activities.

Implementation of the special-status plant impact avoidance and minimization measures shall be reported in the MCRs prepared by the Designated Botanist. Within 30 days after completion of project construction, the project owner shall provide to the CPM, for review and approval in consultation with the BLM State Botanist, a written construction termination report identifying how measures have been completed.

The project owner shall submit a monitoring report every year for the life of the project to monitor effectiveness of protection measures for all avoided special-status plants to the CPM and the BLM State Botanist. The monitoring report shall include dates of worker awareness training sessions and attendees, completed CNDDDB field forms for each avoided occurrence on site and within 100 feet of the project boundary off site, and description of the remedial action if warranted and planned for the upcoming year. The completed forms shall include an inventory of the special-status plant occurrences and description of the habitat conditions, an indication of population and habitat quality trends.

### **SAND DUNE/MOJAVE FRINGE-TOED LIZARD MITIGATION (MFTL)**

**BIO-20** To mitigate for habitat loss and direct impacts to MFTLs, the project owner shall provide compensatory mitigation, which may include compensation lands purchased in fee or in easement in whole or in part, at the following ratios:

1. 3:1 mitigation for direct impacts to stabilized and partially stabilized sand dunes (per **BIO-29 - Table 2** or final acreage impacted by the project footprint);
2. 1:1 mitigation for direct impacts non dune MFTL habitat (per **BIO-29 - Table 2** or final acreage impacted by the project footprint); and
3. 0.5:1 mitigation for indirect impacts to stabilized and partially stabilized sand dunes (per **BIO-29 - Table 2** or final acreage impacted by the project footprint).

If compensation lands are acquired, the project owner shall provide funding for the acquisition in fee title or in easement, initial habitat improvements, and long-term maintenance and management of the compensation lands. In addition, the compensation lands must include, at a minimum, the number acres of stabilized and partially stabilized sand dune habitat shown in **BIO-29 - Table 2**.

1. Criteria for Compensation Lands: The compensation lands selected for acquisition shall:
  - a. Provide suitable habitat for MFTLs, and, aside from the minimum amount of stabilized and partially stabilized sand dunes, may include stabilized and partially stabilized desert dunes, sand drifts over playas, or Sonoran creosote bush scrub;
  - b. Be within the Palen or Chuckwalla valleys with potential to contribute to MFTL habitat connectivity and build linkages between known populations of MFTLs and preserve lands with suitable habitat;

- c. Be prioritized near larger blocks of lands that are either already protected or planned for protection, or which could feasibly be protected long-term by a public resource agency or a nongovernmental organization dedicated to habitat preservation;
  - d. Provide quality habitat for MFTL that has the capacity to regenerate naturally when disturbances are removed;
  - e. Not have a history of intensive recreational use or other disturbance that might make habitat recovery and restoration infeasible;
  - f. Not be characterized by high densities of invasive species, either on or immediately adjacent to the parcels under consideration, that might jeopardize habitat recovery and restoration;
  - g. Not contain hazardous wastes that cannot be removed to the extent the site is suitable for habitat;
  - h. Have water and mineral rights included as part of the acquisition, unless the CPM, in consultation with the BLM, USFWS, and CDFW, agrees in writing to the acceptability of the land; and
  - i. Be on land for which long-term management is feasible.
1. Security for Implementation of Mitigation: The project owner shall provide financial assurances to the CPM to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of MFTL habitat as described in this condition. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the CPM according to the measures outlined in **BIO-12**, and within the time period specified for this assurance (see the verification section at the end of this condition). The final amount due will be determined by an updated appraisal and a PAR analysis conducted as described in **BIO-12**, but current estimates are included in **Biological Resources - Tables 12 and 13** located at the beginning of the conditions of certification subsection of the FSA (Exhibit 2000).
  2. Preparation of Mohave Fringe-toed Lizard Enhancement Measures Management Plan: The project owner shall submit to the CPM, the BLM, and CDFW a draft management plan that reflects site-specific enhancement measures for the MFTL habitat on the acquired compensation lands. The objective of the management plan shall be to enhance the value of the compensation lands for MFTLs, and may include enhancement actions such as weed control, fencing to exclude livestock, erosion control, or protection of sand sources or sand transport corridors.

**VERIFICATION:** No later than 30 days prior to beginning site mobilization and construction activities, the project owner shall provide written verification of an approved form of Security in accordance with this condition of certification. Actual Security shall be provided no later than seven days prior to the beginning of project ground-disturbing activities for the project. The project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities for each project phase.

No less than 90 days prior to acquisition of the property, the project owner shall submit a formal acquisition proposal to the the BLM, USFWS, CDFW and the CPM describing the parcels intended for purchase.

The project owner, or an approved third party, shall provide the CPM, the BLM, and CDFW, with a management plan for the compensation lands and associated funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with the BLM and CDFW.

Within 90 days after completion of project construction, the project owner shall provide to the CPM and CDFW an analysis with the final accounting of the amount (detailed by habitat type) of MFTL habitat disturbed during project construction.

The project owner shall provide written verification to the CPM, and CDFW that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient no later than 18 months from the start of ground-disturbing activities.

## **MITIGATION FOR IMPACTS TO STATE WATERS**

**BIO-21** The project owner shall implement the following measures to avoid, minimize and mitigate for direct and indirect impacts to waters of the state and to satisfy requirements of California Fish and Game Code, sections 1600 and 1607.

1. Acquire Off-site State Waters: The project owner shall acquire, in fee or in easement, a parcel or parcels of land that include state jurisdictional waters per **BIO-29 – Table 2**, or the area of state waters directly or indirectly impacted by the final project footprint. The project footprint means all lands disturbed by construction and operation of the Palen project, including all linears. The parcel or parcels comprising the ephemeral washes shall include desert dry wash woodland per **BIO-29 – Table 2**, or the acreage of desert dry was woodland impacted by the final project footprint at a 3:1 ratio. The terms and conditions of this acquisition or easement shall be as described in Condition of Certification **BIO 12**, and the timing associated with **BIO-29**. The current estimated costs are included in **BIO-29 – Table 3**

located at the beginning of the conditions of certification subsection. Mitigation for impacts to state waters shall occur within the Chuckwalla, East Salton Sea, Hayfield, Rice, or portion of Whitewater within the NECO, Hydrologic Units (HUs) or the Palo Verde Watershed and be prioritized within the Chuckwalla HU in the Palen or adjacent watersheds.

2. Security for Implementation of Mitigation: The project owner shall provide financial assurances to the CPM and CDFW to guarantee that an adequate level of funding is available to implement the acquisitions and enhancement of state waters as described in this condition. These funds shall be used solely for implementation of the measures associated with the project. Financial assurance can be provided to the CPM and CDFW in the form of an irrevocable letter of credit, a pledged savings account or Security prior to initiating ground-disturbing project activities. Prior to submittal to the CPM, the Security shall be approved by the CPM, in consultation with CDFW, to ensure funding. The final amount due shall be determined by updated appraisals and the PAR analysis conducted pursuant to **BIO-12**.
3. Preparation of Drainage Management Plan: The project owner shall submit to the CPM and CDFW a draft Drainage Management Plan that reflects site-specific enhancement measures for the drainages on the acquired compensation lands. The objective of the management plan shall be to enhance the wildlife value of the drainages, and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.
4. Code of Regulations: The project owner shall provide a copy of this condition (Condition of Certification **BIO-21**) from the Energy Commission Decision to all contractors, subcontractors, and the Applicant's project supervisors. Copies shall be readily available at work sites at all times during periods of active work and must be presented to any CDFW personnel upon demand. The CPM reserves the right to issue a stop work order or allow CDFW to issue a stop work order after giving notice to the project owner and the CPM, if the CPM in consultation with CDFW, determines that the project owner has breached any of the terms or conditions or for other reasons, including but not limited to the following:
  - a. The information provided by the Applicant regarding impacts to waters of the state is incomplete or inaccurate;
  - b. New information becomes available that was not known in preparing the terms and conditions; or

- c. The project or project activities as described in the Revised Staff Assessment have changed.
5. Road Crossings at Streams. The project owner shall preserve pre-development downstream flows and sediment transport in washes crossed by permanent roads by incorporating culverts and Arizona crossings at stream crossings. Arizona crossings are the preferred option and shall be employed wherever such crossings do not present a safety hazard and where the roadbed elevation allows the construction of such crossings. Drainages that have been graded for temporary construction access shall be restored to original contours and surface drainage patterns and shall be revegetated according to specifications in **BIO-8**.
6. Best Management Practices: The project owner shall also comply with the following conditions to protect drainages near the Project Disturbance Area:
  - a. The project owner shall minimize road building, construction activities and vegetation clearing within ephemeral drainages to the extent feasible.
  - b. The project owner shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter ephemeral drainages or be placed in locations that may be subjected to high storm flows.
  - c. The project owner shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws, and it shall be the responsibility of the project owner to ensure compliance.
  - d. Spoil sites shall be located at least 30 feet from the boundaries and drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.
  - e. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from project-related activities, shall be prevented from contaminating the soil and/or entering waters of the state. These materials, placed within or where they may enter a drainage, shall be removed immediately.
  - f. No broken concrete, debris, soil, silt, sand, bark, slash, sawdust, rubbish, cement or concrete or washings thereof, oil or petroleum products or other organic or earthen material from any construction

or associated activity of whatever nature shall be allowed to enter into, or be placed where it may be washed by rainfall or runoff into, waters of the state.

- g. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the high water mark of any drainage.
  - h. No equipment maintenance shall occur within 150 feet of any ephemeral drainage where petroleum products or other pollutants from the equipment may enter these areas under any flow.
7. Changes of Conditions. A notifying report shall be provided to the CPM and CDFW if a change of conditions is identified. As used here, change of condition refers to the process, procedures, and methods of operation of a project; the biological and physical characteristics of a project area; or the laws or regulations pertinent to the project as defined below. A copy of the notifying change of conditions report shall be included in the annual reports or until it is deemed unnecessary by the CPM in consultation with CDFW.
- a. Biological Conditions: A change in biological conditions includes, but is not limited to, the following: 1) the presence of biological resources within or adjacent to the project area, whether native or non-native, not previously known to occur in the area; or 2) the presence of biological resources within or adjacent to the project area, whether native or non-native, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of title 14 of the California Code of Regulations.
  - b. Physical Conditions: A change in physical conditions includes, but is not limited to, the following: 1) a change in the morphology of a river, stream, or lake, such as the lowering of a bed or scouring of a bank, or substantial changes in stream form and configuration caused by storm events; 2) the movement of a river or stream channel to a different location; 3) a reduction of or other change in vegetation on the bed, channel, or bank of a drainage, or 4) changes to the hydrologic regime such as fluctuations in the timing or volume of water flows in a river or stream.
  - c. Legal Conditions: A change in legal conditions includes, but is not limited to, a change in Regulations, Statutory Law, a Judicial or Court decision, or the listing of a species, the status of which has changed to endangered, rare, or threatened, as defined in section 15380 of title 14 of the California Code of Regulations.

**VERIFICATION:** No less than 30 days prior to the start of site mobilization and construction-related ground disturbance activities potentially affecting waters of the state, the project owner shall provide written verification (i.e., through incorporation into the BRMIMP) to the CPM that the above BMP will be implemented. The project owner shall also provide a discussion of work in waters of the state in Annual Compliance Reports for the duration of the project.

No less than 30 days prior to beginning project ground-disturbing activities, the project owner shall provide to the CPM design drawings demonstrating how pre-development drainage patterns (location and volume of flows) to drainages downstream of the project boundaries will be unaffected. At the same time the project owner shall provide design drawings for temporary and permanent stream crossings.

No less than 30 days prior to beginning project ground-disturbing activities, the project owner shall provide the form of Security in accordance with this condition of certification. No later than seven days prior to beginning project ground-disturbing activities, the project owner shall provide written verification of the actual Security. The project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities.

The project owner, or an approved third party, shall provide the BLM, USFWS, CDFW, and the CPM with a management plan for the compensation lands and associated funds within 180 days of the land or easement purchase, as determined by the date on the title. The CPM shall review and approve the management plan, in consultation with the BLM, USFWS, and CDFW.

Within 90 days after completion of project construction, the project owner shall provide to the CPM, the BLM, USFWS, and CDFW an analysis with the final accounting of the amount of jurisdictional state waters disturbed during project construction.

The project owner shall provide written verification to the CPM, the BLM, USFWS and CDFW that the compensation lands or conservation easements have been acquired and recorded in favor of the approved recipient no later than 18 months of the start of project ground-disturbing activities.

The project owner shall notify the CPM and CDFW, in writing, at least five days prior to initiation of project ground-disturbing activities in jurisdictional state waters and at least five days prior to completion of project activities in jurisdictional areas. The project owner shall notify the CPM and CDFW of any change of conditions to the project, impacts to state waters, or the mitigation efforts.

## CLOSURE AND RECLAMATION PLAN

**BIO-22** Upon project closure the project owner shall implement a final Closure and Reclamation Plan. The Closure and Reclamation Plan shall include a cost estimate for implementing the proposed closure and reclamation activities, and shall be consistent with the guidelines in the BLM's 43 CFR 3809.550 et seq.

**VERIFICATION:** No fewer than 30 days prior to the start of site mobilization and construction activities or alternate date as agreed to with the BLM, the project owner shall provide to the CPM (for review) and the BLM (for review and approval) a draft Closure and Reclamation Plan. The plan shall be finalized prior to the start of commercial operation and reviewed every five years thereafter and submitted to the CPM for review and to the BLM for approval. Modifications to the approved Closure and Reclamation Plan shall be made only after approval from the BLM. The project owner shall provide a copy of the approved Closure and Reclamation Plan and any BLM approved revisions to the CPM.

## GROUNDWATER DEPENDENT VEGETATION MONITORING

**BIO-23** The project owner shall prepare a Groundwater-Dependent Vegetation Monitoring Plan (Plan) for monitoring the project effects of groundwater pumping on groundwater dependent vegetation. The monitoring shall encompass the area depicted in Figure **Soil and Water - 14** (Chuckwalla Valley Groundwater Basin Impacts to Groundwater Basin Impacts to Groundwater Levels, End of Operation) within the 0.1-foot drawdown polygon of the Model Predicted Drawdown. The vegetation and groundwater data collected as part of the Plan shall be used to determine if remedial action is required, as described in **BIO-24**.

The project owner may forgo development of a Plan, or may cease implementation of such a Plan, by providing evidence to the CPM that the source of water for the GDEs is a shallow-perched water-bearing zone rather than the regional groundwater system and that the shallow-perched water-bearing zone is unrelated and not influenced by the regional groundwater system that the project owner proposes to use for water as described below under 15a – 15d.

The project owner shall develop and implement a Plan that meets the performance standards described below and includes the following components:

1. Monitoring Objectives and Performance Standards. The objectives of the Plan shall be to monitor the project effects of groundwater pumping on vegetation and groundwater-dependent ecosystems (GDEs) and, in conjunction with the remedial action described in **BIO-24**, to ensure

that the project groundwater pumping has a less-than-significant effect on biological resources. Monitoring shall be conducted at a level of detail adequate for detecting adverse effects, as reflected in vegetation attributes and groundwater levels in the shallow (alluvial) aquifer. The baseline for groundwater levels shall be the lowest baseline water level as measured at the project site prior to the start of groundwater pumping.

2. Location of Monitoring Plots. The monitoring plots shall be established within the area depicted in Figure **Soil and Water - 14** (of the FSA [Exhibit 2000]) (*Project Only Revised Operational Water Supply End of 30 Years Chuckwalla Valley Groundwater Basin Impacts to Groundwater Basin Impacts to Groundwater Levels, End of Operation*) within the Model Predicted Drawdown showing the 0.1-foot drawdown polygon. The majority of the plots shall be in the area north and east of the project site, where GDEs and the intersection of the ground surface and shallow groundwater are located, in the topographic lows in the valley.
3. Monitoring Plots and Controls. Because of the variation in vegetation types and depth to groundwater within the predicted groundwater drawdown zone, the study design shall treat the monitoring plot with a corresponding control plot as a pair (versus comparing the mean of all treatment plots to the mean of all control plots). The “control” plots shall consist of the data collected at the same plot during the baseline (pre-disturbance) monitoring for a pre-disturbance vs. post-disturbance comparison. Appropriate statistical methods shall be used to analyze the differences between the control and monitoring plots (for example, a one-tailed paired-sample statistical test [Manly 2008]<sup>16</sup>).
4. Off-site Reference Plots: Off-site monitoring plots shall be established as reference sites to distinguish changes in plant vigor seen at the site from the effects of a region-wide drought. The off-site reference plots can be located within Chuckwalla Valley, but shall be within areas that would not be affected hydrologically by groundwater pumping for the project or other projects or agricultural operations. Off-site monitoring reference plots shall be located in the same general hydrologic and geologic setting (i.e., playa margins), in the same climatic region (Sonoran Desert region of California), and contain the same natural communities or vegetation alliances as those to which they are being compared. Impacts from pests and diseases, if present, must also be

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<sup>16</sup> Manly, B. 2008. *Statistics for Environmental Science and Management* (2<sup>nd</sup> ed). CRC Press/Chapman and Hall. 292 pages.

considered and excluded or adjusted for as part of the analysis. Data on climate and surface runoff in the study area shall be collected to identify “drought” conditions and correlate groundwater changes and weather changes.

5. Sample Size and Design. The number of monitoring sites shall be established using appropriate statistical methods (for example, by a “priori power analysis” [Elzinga et al., 1998]) and shall be sufficient to achieve adequate (90%) statistical power. Following collection of the baseline data a statistical analysis shall be conducted to refine the power analysis and evaluate the adequacy of the sampling design. If the analysis of baseline data indicates that the sampling design is insufficient to achieve adequate statistical power, the design shall be modified (for example, by adding additional monitoring sites).
6. Water Table Monitoring. The project owner shall install piezometers at each of the dominant vegetation community types within or near the monitoring plots. The number, location, depth, and monitoring frequency of the piezometers shall be sufficient to establish the effect of project groundwater pumping on the shallow aquifer water levels. At a minimum, each piezometer shall be monitored twice per year, in early spring (March) and post-monsoon (September). The piezometers shall be designed to monitor the maximum expected fluctuation in the water table and to last the duration of the project. Data collected from the project wells and piezometers for **Soil &Water - 4** (Groundwater Level Monitoring, Mitigation, and Reporting) and **Soil &Water - 6** (groundwater monitoring for the evaporation ponds and land treatment unit) shall be used to refine the modeling of the predicted groundwater drawdown and zone of influence after two years of data collection following the start of groundwater production. The project owner shall submit to the CPM, for review and approval, a report on the results of the refined modeling. The report shall include all calculations and assumptions made in development of report data and interpretations, and all well monitoring data and piezometer data collected and used in the calculations. If the results indicate that the drawdown and zone of influence is greater than the effect predicted in the Groundwater Resources Investigation (GRI), and the GDEs are found to be drawing groundwater that is hydraulically connected to the regional groundwater system, then the project owner will submit a revised monitoring plan for GDE areas outside of the original monitoring area.
7. Soil Monitoring. Soil salinity and pH shall be monitored annually at every monitoring plot. The Plan shall describe the monitoring devices and techniques used to collect and interpret this data, relative to

ecosystem function. One soil core sample per community type shall be collected as part of the baseline data to establish the approximate rooting depth of the phreatophytes, and thereafter shall be repeated every five years. The coring method must provide a continuous core that will provide visual examination of roots and root nodules, soil profile, and soil moisture.

8. Baseline and Long-term Data Collection. At a minimum, baseline data shall be collected at all monitoring sites prior to the start of pumping; however, vegetation data collected from sites farther from the nearest wells will allow for the collection of multiple years of “pre-disturbance” data. Because the proposed well in the northeast portion of the project (**Soil & Water Figure 14**, of the FSA [Exhibit 2000]) is located in very close proximity to known phreatophytes, this well shall not be used within the first three years of the project in order to allow an adequate period for baseline data collection in the area northeast of the project. Subject to approval by the CPM, if groundwater pumping ceases or is replaced by other water sources, groundwater and vegetation monitoring shall continue for a period of five years or until refined modeling indicates that the groundwater levels have returned to baseline levels and the decline in plant vigor has been restored to pre-disturbance conditions.
9. Target Vegetation Population. The monitoring sites shall include GDEs and other vegetation potentially affected by the drawdown that occurs within the zone of influence. The following phreatophytes have been documented to occur around Palen Lake: honey mesquite (*Prosopis glandulosa*); iodine bush (*Allenrolfea occidentalis*); bush seep-weed (*Suaeda moquinii*); jackass clover (*Wislizenia refracta*); four-wing saltbush (*Atriplex canescens*); allscale (*A. polycarpa*); spinescale (*A. spinifera*); a potentially new taxon of saltbush (*Atriplex* sp. nov. Andre); ironwood (*Olneya tesota*); palo verde (*Cercidium microphyllum*); cat’s claw (*Acacia greggii*); and smoke tree (*Psoralea spinosus*). The final number of each community type sample needed shall be based on the *priori* power test conducted after the first year of baseline data collection.
10. Fine-Scale Vegetation Mapping. Within the monitoring sites vegetation shall be mapped to the alliance level, consistent with classification protocol in the *Manual of California, 2<sup>nd</sup> edition* (Sawyer et al., 2009), but any important associations shall also be mapped. Mapping shall be done using minimum 1 meter resolution color orthophotos or higher resolution infrared imagery. The mapping shall also be used to determine the acreages of GDEs and establish the amount of Security

to be deposited in the event that adverse effects are detected during the monitoring. Boundaries of the permanent plots and any off-site reference sites shall be recorded using GPS technology and depicted on the geo-referenced aeriels. GIS shape files and metadata shall be submitted along with the draft Plan and any subsequent revisions to the Plan (i.e., following the collection of baseline data and subsequent power analysis).

11. Guidelines for the Monitoring Plan. The Groundwater-Dependent Vegetation Monitoring Plan (Plan) shall be prepared with guidance from *Measuring and Monitoring Plant Populations* (Elzinga et al., 1998). The Plan shall provide a detailed description of each of the following components:
  - a. Sampling Design. The sampling design shall include a description of a) the populations (vegetation types) sampled, b) number, size, and shape of the sampling units, c) layout of the sampling units, d) methods for permanently marking plots in the field, e) monitoring schedule/frequency, f) vegetation and other attributes sampled, and g) sampling objectives (target/threshold, change/trend-based) for each attribute.
  - b. Habitat Function and Values. The Plan shall describe the hydrologic, geologic/geomorphic, geochemical, biological and ecological characteristics of the GDEs, and shall also describe whether species are obligate or facultative, root growth and water acquisition characteristics, morphological adaptations to the desert environment, reproduction and germination characteristics, general and micro-habitat preferences, obligate or facultative halophytes and phreatophytes, role in the morphology of dunes, and importance to wildlife, etc.
  - c. Field Techniques for Measuring Vegetation. This will include the vegetation (or other) attributes selected based on a demonstrated knowledge of the biology and morphology of the species, and include a discussion of the limitations involved in each measurement. Examples of appropriate field techniques for measuring drought response include percent dieback, live crown density, crown height and width, percent cover of live (versus dead or residual) vegetation, percent cover/frequency of associated species, percent composition of native versus non-native species, and percent cover based on wetland status codes (OBL, FACW,

FAC, FACU, UPL<sup>17</sup>), and status as phreatophytes or halophytes. Photo monitoring shall not be considered an acceptable monitoring method but may be useful to conduct periodically (e.g., every three to five years).

- d. Data Management. Including how the data will be recorded in the field (e.g., using a GPS data dictionary), processed, and stored.
  - e. Training of Personnel. Describe minimum standards for training and monitoring personnel.
  - f. Statistical Analysis. Describe statistical methods used to analyze the monitoring data (incorporating the minimum standards for statistical power and error rate described above).
12. Peer Review of the Plan. The draft Plan shall undergo a peer review by recognized experts, which shall include one or more scientists with expertise in the preparation of monitoring plans for plant populations, the physiological responses of desert phreatophytes to drought stress, assessing the effects of groundwater withdrawal on vegetation in the desert region, and biostatistics. The project owner shall provide the resumes of suggested peer reviewers to the CPM for review and approval.
13. Annual Monitoring Report. Annual Monitoring Reports shall be submitted to the CPM and the BLM and shall include, at a minimum, the following: a) names and contact information for the responsible parties and monitoring personnel; b) summaries of the results of the monitoring as required in **Soil & Water - 4 and Soil & Water – 6**; c) piezometer monitoring results, and a comparison of predicted versus actual water table declines; d) summary of the results of vegetation, groundwater, and soil monitoring data compared to the baseline data for each plot (pre- versus post-disturbance comparison); e) description of sampling and monitoring techniques used for each attribute; f) description of the data management and statistical analysis; g) photos; and h) conclusions and recommendations for remedial action if the monitoring data indicates that the threshold described below has been met.

The first Annual Monitoring Report shall include an appropriate statistical analysis using the first year baseline monitoring data to

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<sup>17</sup> OBL= Obligate Wetland; FACW= Facultative Wetland; FAC= Facultative; FACU= Facultative Upland UPL= Obligate Upland. *In*; U.S. Fish and Wildlife Service. 1993. **1993 supplement to list of plant species that occur in wetlands: Northwest (Region 9)**. Supplement to U.S. Fish & Wildlife Service Biological Report 88 (24.9). Online: <http://plants.usda.gov/wetinfo.html>

assess whether the sampling design was adequate to provide statistically meaningful data as described above. If warranted, the first year Annual Monitoring Report shall include recommendations for revisions to the Plan based on this analysis.

14. Threshold for Remedial Action: The project owner shall implement remedial action, as described in Condition of Certification **BIO-24**, if the monitoring described in **BIO-23** detects a decline in plant vigor of 20 percent or more compared to the same plots pre-disturbance and also detects a decline in the alluvial (shallow) aquifer confirmed by two consecutive annual water monitoring events in any amount greater than the lowest baseline water level as measured prior to groundwater pumping. If regional drought, off-site pumping or other activities unrelated to the project are also contributing to the decline in water table, the project owner shall only be responsible for the portion of the effect that can be statistically demonstrated to be the result of project pumping. To determine whether declines in plant vigor are related to project pumping as opposed to region wide drought or off-site pumping conditions, the project owner shall install a network of background monitoring piezometers and incorporate these data in the assessment of project-related effects on GDEs.
15. To understand the source of the water for the GDEs, the project owner shall prepare a groundwater investigation work plan for submittal to the CPM that will outline steps to determine if the source of water for the GDEs is a shallow-perched water-bearing zone rather than the regional groundwater system, and that the shallow-perched water-bearing zone is not hydraulically connected to the regional groundwater system. The groundwater investigation will be comprised of the following components:
  - a. A continuous soil coring program at five locations to be identified based on field mapping of GDEs in the area shown on the Figure **Soil and Water-14** (of the FSA [Exhibit 2000]) within the 0.1-foot drawdown polygon of the Model Predicted Drawdown. One of the five borings will be drilled adjacent to a GDE containing mesquite, and the other four located to provide an assessment of the range of plant communities within GDEs in the area of interest (i.e., to assess the variability of GDE plant type water requirements and root zone depth).
  - b. The soil cores shall extend a minimum of 20 feet below the deepest root zones of the GDEs investigated to demonstrate separation between the shallow and regional water zones. At a minimum the

soil cores shall show that 20 feet of unsaturated conditions are present below the deepest root zones of the plant communities investigated. The soil cores will be logged by a professional geologist in the State of California, and the coring program will be overseen by a qualified biologist with experience in the plant communities identified within each GDE.

- c. A sampling plan for selective analysis of soil moisture content and saturation will also be conducted for each soil core advanced adjacent to a GDE. The number and frequency of soil samples shall be established to confirm field observations of soil moisture content in the shallow water-bearing zone, through the root zone and in the deeper sediments below the root zone above the regional water table. Soil samples shall be analyzed for moisture content after ASTM Method D2216.
- d. Depending on the results of the soil coring program, piezometers may be installed as monitoring points for the regional water table and to monitoring changes in the shallow water-bearing zone from project pumping. In the report of results from the soil coring program, a water-level monitoring program shall be proposed if it is shown that the regional water table is in direct hydraulic connection to the source of water to the GDEs. If the field data clearly shows an unsaturated zone of 20 feet or more below the deepest root zones of the GDEs, then piezometers will not be installed.

If the results of the pre-construction field observations and soil sampling demonstrate 20 feet or more of unsaturated sediments between the deepest root zones of the GDEs and the regional water table, there will be no requirements to implement any of the underlying conditions as provided for in **BIO-23** and **BIO-24**, as sufficient evidence will have been provided to demonstrate that the groundwater is not the source for the GDEs.

If the refined modeling of the predicted groundwater drawdown and zone of influence after two years of data collection (following the start of groundwater production), as described in subsection 6 of this condition and in **Soil & Water - 4** and **Soil & Water - 6**, indicates the drawdown or zone of influence would be greater than predicted in the project owner's GRI, and the GDE are found to be drawing groundwater that is hydraulically connected to the regional groundwater system, then the project owner will submit a revised monitoring plan for GDE areas outside of the original monitoring area .

**VERIFICATION:** At least 30 days prior to operation of project pumping wells, the project owner shall submit to the CPM and the BLM for review and approval a draft Groundwater-Dependent Vegetation Monitoring Plan (Plan). The final plan shall incorporate recommendations from the peer review and shall be submitted to the CPM and the BLM no less than 15 days prior to the start of groundwater pumping.

No less than 15 days prior to the start of groundwater pumping the project owner shall submit as-built drawings indicating the location and depth of piezometers, and shall provide evidence that the piezometers are operational.

Baseline groundwater and groundwater-dependent vegetation monitoring shall begin 15 days prior to construction and shall occur every year during the same one- to two-week time period in early spring (March) and post-monsoon (September).

The First Annual Monitoring Report shall be provided to the CPM and the BLM no later than January 31st following the first year of data collection, and shall include an assessment of whether the sampling design would provide statistically adequate monitoring data and whether modifications to the monitoring design would be needed. If the first Annual Monitoring Report recommends a revised sampling design, the project owner shall submit the revised Plan to the CPM and the BLM no later than March 1st.

Thereafter, the project owner shall submit a Groundwater-Dependent Vegetation Annual Monitoring Report to the CPM and the BLM no later than January 31st of each year for the duration of project operation.

If the project owner elects to prepare a geologic and groundwater investigation (as described in subsection 15 a-d of this condition) to determine if the source of water for the GDEs is a shallow-perched water-bearing zone rather than the regional groundwater system, and that the shallow-perched water-bearing zone is not hydraulically connected to the regional groundwater system that the project owner proposes to use for water supply, the project owner shall submit the resumes of at least two independent qualified peer reviewers 45 days prior to submittal of the report to the CPM and the BLM for review and approval. The project owner must submit the results of their investigation, subject to review and approval by the CPM, prior to the start of construction or project groundwater use.

If the refined modeling conducted according subsection 6 of this condition indicates that the drawdown and zone of influence is greater than the effect predicted in the GRI, and the GDE are found to be drawing groundwater that is hydraulically connected to the regional groundwater system, then the project owner shall submit a Revised Monitoring Plan for GDE areas outside of the original monitoring area. The Revised Monitoring Plan shall be submitted no later than January 31st in the third year following the start of groundwater pumping and well monitoring.

## REMEDIAL ACTION AND COMPENSATION FOR ADVERSE EFFECTS TO GROUNDWATER-DEPENDENT BIOLOGICAL RESOURCES

**BIO-24** If monitoring detects project-related adverse impacts to groundwater dependent ecosystems (GDEs) as described in **BIO-23**, and the impacts are shown to be the result of a decline in the regional groundwater table due to project pumping, the project owner shall determine which well(s) are the source of the adverse impacts and shall implement remedial measures as outlined below. If regional drought, off-site pumping or other activities unrelated to the project are also contributing to the decline in water table, the project owner shall only be responsible for the portion of the effect that can be demonstrated to be the result of project pumping. The remedial measures shall be implemented with the objective of restoring the groundwater levels to the baseline described in **BIO-23**, and shall compensate for impacts to GDEs with off-site habitat acquisition or restoration. The project owner shall do all of the following:

1. Modification and/or Cessation of Pumping: The project owner shall provide to the CPM evidence based on groundwater monitoring and modeling indicating which wells are likely to be causing adverse impacts to GDEs. The project owner shall initially modify operation of those wells to reduce the off-site drawdown in the areas of the GDEs.
2. Remedial Action Plan: The objective of remedial action shall be restoration of the spring groundwater table in the alluvial (shallow) aquifer to baseline levels, as described in **BIO-23**. The Remedial Action Plan shall include one or more of the following measures: 1) begin rotational operation of the site water supply wells reducing pumping in wells that are the most proximal to the GDEs; 2) reducing the pumping rate in the wells that have been identified as the cause of the drawdown in the area of the GDEs; 3) focus pumping on wells on the southern portion of the project site away from the GDEs; and 4) cease operation of the well(s) that are the cause of the drawdown. Groundwater water level monitoring shall increase to a frequency necessary to document change and recovery in the drawdown from the changes in the pumping program.

The Remedial Action Plan shall include a water level monitoring program of sufficient frequency to document changes in operation of the water supply wells, and demonstrate that the water table has been restored to baseline levels.

The project owner shall use the following guidelines for determining if an ecosystem (or species) is phreatophytic (Brown, et al., 2007; LeMaitre, et al., 1999; Froend & Loomes, 2004):

- a. It is not known or documented to depend on groundwater, based on scientific literature or expert opinion (local knowledge can be useful in making a determination as some species' dependence varies by setting);
  - b. The species are not known to have roots extending over a meter in depth;
  - c. The community does not occur in an area where the water table is known to be "near" the surface (relative to the documented rooting depths of the species);
  - d. The herbaceous or shrub vegetation is not still green and/or does not have a high leaf area late in the dry season (compared to other dry areas in the same watershed that do not have access to groundwater).
3. Compensate for Loss of Ecosystem Function. If the decline in the water table in the alluvial (shallow) aquifer is accompanied by a corresponding decline in plant vigor greater than 20 percent (as described in **BIO-23**), the project owner shall compensate for the loss of habitat functions and values in the affected groundwater-dependent ecosystems. The amount of compensation shall be at a 3:1 ratio based on area of affected area, using mapping as described in **BIO-23**. The project owner shall acquire, in fee or in easement, a parcel or parcels of land that include an amount of groundwater-dependent vegetation that is of the same habitat-type as the community affected (e.g., mesquite woodland, alkali sink scrubs, or microphyll woodland) and of an equal or greater habitat quality. The compensation lands shall be located within the watersheds encompassing the Chuckwalla or Palen Valleys. As an alternative to habitat compensation, the project owner may submit a plan that achieves restoration of lost habitat function and value at another location within the Chuckwalla Groundwater Basin that contains the same habitats as those affected.
- a. Review and Approval of Compensation Lands Prior to Acquisition or Restoration. The project owner shall submit a formal acquisition proposal to the CPM describing the parcel(s) intended for purchase. This acquisition proposal shall discuss the suitability of the proposed parcel(s) as compensation lands in relation to the criteria listed above. Approval from the CPM shall be required for acquisition of all compensatory mitigation parcels.
  - b. Preparation of Site-specific Enhancement Measures Management Plan: The project owner shall submit to the CPM and CDFW a draft management plan that reflects site-specific enhancement measures

for the acquired compensation lands. The objective of the management plan shall be to maintain the functions and values of the acquired GDE plant communities and may include enhancement actions such as weed control, fencing to exclude livestock, or erosion control.

- c. Delegation of Acquisition. The responsibility for acquisition of compensation lands may be delegated to a third party such as a nongovernmental organization supportive of desert habitat conservation, by written agreement of the Energy Commission. Such delegation shall be subject to approval by the CPM prior to land acquisition, enhancement or management activities.

**VERIFICATION:** No more than 30 days following submission of the Groundwater Dependent Vegetation Annual Monitoring Report the project owner shall submit to the CPM for review and approval a draft Remedial Action Plan if that report indicates that the threshold for remedial action as described in **BIO-23** has been met. At the same time the project owner shall submit written evidence that the project wells responsible for impacts to groundwater levels and GDEs have modified their operation or ceased operation.

A final Remedial Action Plan shall be submitted to the CPM within 30 days of receipt of the CPM's comments on the draft plan. No later than six months following approval of the final Remedial Action Plan, the project owner shall provide to the CPM written documentation of the effectiveness of the completed remedial action.

No more than 30 days following submission of the Groundwater-Dependent Vegetation Annual Monitoring Report, the project owner shall provide to the CPM a final accounting of the amount of GDE habitat affected by project groundwater pumping.

No more than six months following submission of the Groundwater-Dependent Vegetation Annual Monitoring Report, the project owner shall submit a formal acquisition or restoration proposal to the CPM, describing the mitigation parcels intended for purchase or restoration. The acquisition/restoration proposal shall describe how the proposed parcels meet the acquisition or restoration criteria described in this condition.

No fewer than 90 days prior to compensatory acquisition or restoration, the project owner shall submit to the CPM and obtain CPM approval of any agreements to delegate land acquisition to an approved third party, or to manage compensation lands; such agreement shall be executed and implemented no more than months following approval of the acquisition proposal.

The project owner shall provide written verification to the CPM that the compensation lands or conservation easements have been acquired and recorded in favor of the

approved recipient no later than 18 months from submission of the Groundwater-Dependent Vegetation Annual Monitoring Report.

## **EVAPORATION POND NETTING AND MONITORING**

**BIO-26** The project owner shall cover the evaporation ponds prior to any discharge with 1.5-inch mesh netting designed to exclude birds and other wildlife from drinking or landing on the water of the ponds. Netting with mesh sizes other than 1.5-inches may be installed if approved by the CPM in consultation with the BLM, USFWS, and CDFW. The netted ponds shall be monitored regularly to verify that the netting remains intact, is fulfilling its function in excluding birds and other wildlife from the ponds, and does not pose an entanglement threat to birds and other wildlife. The ponds shall include a visual deterrent in addition to the netting, and the pond shall be designed such that the netting shall never contact the water. Monitoring of the evaporation ponds shall include the following:

1. Monthly Monitoring. The Designated Biologist or biological monitor shall regularly survey the ponds at least once per month starting with the first month of operation of the evaporation ponds. The purpose of the surveys shall be to determine if the netted ponds are effective in excluding birds, if the nets pose an entrapment hazard to birds and wildlife, and to assess the structural integrity of the nets. The monthly survey shall be conducted in 1 day for a minimum of two hours following sunrise (i.e., dawn), a minimum of 1 hour mid-day (i.e., 1100 to 1300), and a minimum of two hours preceding sunset (i.e., dusk) in order to provide an accurate assessment of bird and wildlife use of the ponds during all seasons. Surveyors shall be experienced with bird identification and survey techniques. Operations staff at the project site shall also report finding any dead birds or other wildlife at the evaporation ponds to the Designated Biologist within 1 day of the detection of the carcass. The Designated Biologists shall report any bird or other wildlife deaths or entanglements within two days of the discovery to the the BLM, USFWS, CDFW and the CPM.
2. Dead or Entangled Birds. If dead or entangled birds are detected, the Designated Biologist shall take immediate action to correct the source of mortality or entanglement. The Designated Biologist shall make immediate efforts to contact and consult the BLM, USFWS, CDFW and the CPM by phone and electronic communications prior to taking remedial action upon detection of the problem, but the inability to reach these parties shall not delay taking action that

would, in the judgment of the Designated Biologist, prevent further mortality of birds or other wildlife at the evaporation ponds.

3. Quarterly Monitoring. If after 12 consecutive monthly site visits no bird or wildlife deaths or entanglements are detected at the evaporation ponds by or reported to the Designated Biologist, monitoring, as described in paragraph 1, can be conducted on a quarterly basis.
4. Biannual Monitoring. If after 12 consecutive quarterly site visits no bird or wildlife deaths or entanglements are detected by or reported to the Designated Biologist, with approval from the BLM, USFWS, CDFW, and the CPM, future surveys may be reduced to two surveys per year during the spring nesting season and during fall migration. If approved by the the BLM, USFWS, CDFW, and the CPM, monitoring outside the nesting season may be conducted by the Environmental Compliance Manager.
5. Modification of Monitoring Program. The BLM, USFWS, or CDFW may submit a request for modifications to the evaporation pond monitoring program based on information acquired during monitoring, and may also suggest adaptive management measures to remedy any problems that are detected during monitoring or modifications if bird impacts are not observed. Modifications to the evaporation pond monitoring described above and implementation of adaptive management measures shall be made only after approval from the CPM, in consultation with the BLM, USFWS, and CDFW.

**VERIFICATION:** No less than 30 days prior to operation of the evaporation ponds the project owner shall provide to the CPM as-built drawings and photographs of the ponds indicating that the bird exclusion netting has been installed. For the first year of operation the Designated Biologist shall submit quarterly reports to the CPM, the BLM, USFWS, and CDFW describing the dates, durations and results of site visits conducted at the evaporation ponds. Thereafter the Designated Biologist shall submit annual monitoring reports with this information. The quarterly and annual reports shall fully describe any bird or wildlife death or entanglements detected during the site visits or at any other time, and shall describe actions taken to remedy these problems. The annual report shall be submitted to the CPM, the BLM, USFWS, and CDFW no later than January 31st of every year for the life of the project.

## **REVEGETATION & RESTORATION OF TEMPORARILY DISTURBED AREAS**

Staff and the prior project owner agreed to delete this condition.

## IN-LIEU FEE MITIGATION OPTION

**BIO-28** The project owner may choose to satisfy its mitigation obligations by paying an in-lieu fee instead of acquiring compensation lands, pursuant to Fish and Game Code sections 2069 and 2099. Alternately, the CPM in conjunction with the BLM, USFWS, and CDFW, may approve the project owner's use of another mitigation program or any other applicable in-lieu fee provision, provided that the project's in-lieu fee proposal or mitigation program is found by the CPM to mitigate the impacts identified therein. If the in-lieu fee proposal or mitigation program is found by the CPM, in coordination with the BLM, USFWS, and CDFW, to be in compliance, and the project Owner chooses to satisfy its mitigation obligations through the in-lieu fee, the project owner shall provide proof of the in-lieu fee payment to the CPM prior to construction related ground disturbance.

**VERIFICATION:** If electing to use this provision, the project owner shall notify the CPM that it would like a determination that the project's in-lieu fee proposal would mitigate for the impacts identified herein. Prior to site mobilization and construction related ground disturbance, the project owner shall provide proof of the in lieu fee payment to the CPM.

## PROJECT COMPENSATORY MITIGATION UNDER THE REDUCED ACREAGE ALTERNATIVE

**BIO-29** The project owner shall provide compensatory mitigation for the total Project Disturbance Area (and may provide such mitigation for Unit 1, the PSEGS Common Area, plus 70 acres from Unit 2 for a total combined acreage of approximately 1,960 acres (i.e., the Reduced Acreage Alternative) or an updated figure provided by project owner and approved by the CPM. For purposes of this condition, the project Disturbance Area means all lands disturbed in the construction and operation of the Palen Solar Energy Generating System Project Reduced Acreage Alternative , including all linears and ancillary facilities, as well as undeveloped areas inside the project's boundaries that would no longer provide viable long-term habitat.

The disturbance area for each resource type is provided in **BIO-29 - Table 1** below. Mitigation is shown in **BIO-29 - Table 2**, and mitigation Security is shown in **BIO-29 - Table 3** below. This table shall be refined prior to the start of construction with the disturbance area adjusted to reflect the final project footprint. Prior to initiating construction, the project owner shall submit the actual construction schedule, a figure depicting the locations of proposed construction and amount of acres to be disturbed. Mitigation acres are calculated based on the compensation requirements for each resource type as described in the above Conditions of Certification – **BIO-12** (Desert Tortoise), **BIO-20** (Mojave Fringe-toed Lizard), **BIO-18**

(Western Burrowing Owl), and **BIO-22** (State Waters). Compensatory mitigation for each phase shall be implemented according to the timing required by each condition.

**BIO-29 - Table 1. Area of Habitat Type Disturbed by Construction Phase (Acres)<sup>1</sup>**

Habitat Type	PSEGS Disturbance Area	
<b>MFTL Habitat</b>		
Stabilized & Partially Stabilized Dunes	0	
Non Dunes	34.2	
Indirect Impacts <sup>2</sup>	0	
<b>TOTAL</b>	<b>34.2</b>	
<b>DT Habitat</b>		
DT Habitat - inside critical habitat	172.2	
DT Habitat - outside critical habitat	770.2	
DT Indirect Habitat - inside critical habitat	3.7	
DT Direct Habitat - outside critical habitat	8	
<b>TOTAL<sup>3</sup></b>	<b>954.1</b>	
<b>WBO Habitat</b>		
Impacts to 4 WBO <sup>4</sup>	4 WBO	
<b>TOTAL</b>	<b>4 WBO</b>	
<b>Jurisdictional Waters (Direct Impact)</b>		
Dry Desert Wash Woodland	17.95	
Unvegetated Ephemeral Dry Wash	10.9	
<i>Subtotal</i>	28.85	
<b>Jurisdictional Waters (Indirect Impact)</b>		
Dry Desert Wash Woodland	0.03	
Unvegetated Ephemeral Dry Wash	0.04	
<i>Subtotal</i>	0.08	
<b>TOTAL WATERS</b>	<b>28.93</b>	

1 – Sources: PSH Final Comments on the PSA (Palen 2013pp) and Geomorphic Assessment of Sand Transport for the Modified Project (Palen Solar Electric Generating System) (CEC 2013v)

2 –Project owner assumed 39.7 of indirect impacts for private parcel adjacent to project site however Staff will provide an independent assessment of indirect impacts. Indirect impacts will be assessed pending results of additional sand transport modeling in the Final Staff Assessment.

3 – Raven Acres subject to the one-time USFWS Regional Raven Management Program fee are equivalent to the total DT Habitat impact acreages.

4 – Impact to Burrowing Owl may change based on results of additional Burrowing Owl surveys along proposed modified generation tie-line corridor and new natural gasline corridor.

**BIO 29 Table - 2. Mitigation by Habitat Type Disturbed by Construction Phase  
(Acres)<sup>1</sup>**

Habitat Type	Mitigation Ratio	PSEGS Disturbance Area	
<b>MFTL Habitat</b>			
Stabilized & Partially Stabilized Dunes	3:1		
Non Dunes	1:1	34.2	
Indirect Impacts	0.5:1	0	
<b>TOTAL</b>		<b>34.2</b>	
<b>DT Habitat</b>			
DT Habitat - inside critical habitat <sup>2</sup>	5:1	861	
DT Habitat - outside critical habitat	1:1	770.2	
DT Indirect Habitat - inside critical habitat	5:1	18.50	
DT Direct Habitat - outside critical habitat	1:1	8	
<b>TOTAL</b>		<b>1657.7</b>	
<b>WBO Habitat</b>			
Impacts to 4 WBO	19.5 acre/WBO	78	
<b>TOTAL</b>		<b>78</b>	
<b>Jurisdictional Waters (Direct Impact)</b>			
Vegetated (Dry Desert Wash Woodland)	3:1	53.9	
Unvegetated Ephemeral Dry Wash	1:1	10.9	
<i>Subtotal</i>		64.8	
<b>Jurisdictional Waters (Indirect Impact)</b>			
Vegetated (Dry Desert Wash Woodland)	1.5:1	0.05	
Unvegetated Ephemeral Dry Wash	0.5:1	0.03	
<i>Subtotal</i>		0.07	
<b>TOTAL WATERS</b>		<b>64.8</b>	

1 – Sources: Palen 2013pp except for indirect impacts to MFTL (2013v)

2 – Impacts to Desert Tortoise critical habitat are assumed to be within the Phase 1 and Phase 2 Project Disturbance Area.

**BIO-29 Table - 3. Mitigation Securities by Construction Phase (Acres) <sup>1</sup>**

Habitat Type	PSEGS Security	
MFTL Habitat	\$85,537	
DT Habitat	\$5,116,816	
Raven Fee Impacts <sup>2</sup>	\$100,181	
WBO Habitat	\$250,089	
Jurisdictional Waters	\$200,720	
Total	\$5,753,343	

1– Securities (aside from Raven fees) based on REAT Biological Resources Mitigation/Compensation Cost Estimate Calculation Table - July 23, 2010 (REAT 2010), adjusted to reflect a 160-acre parcel size estimate. Security does not include authorized entity fees. Security amounts may change based on final Project footprint. The final amount shall be determined by an updated appraisal conducted as described in **BIO-12**.

2 – Based on U.S. Fish and Wildlife Service Cost Allocation Methodology for Implementation of the Regional Raven Management Plan, dated July 9, 2010 (USFWS 2010b). Fee calculated at \$105/acre for direct project impacts.

**VERIFICATION:** The project owner shall not disturb any area outside of the area that has been approved in this Decision.

No less than 30 days prior to the start of Desert Tortoise clearance surveys, , the project owner shall submit a description of the proposed construction activities to the BLM, USFWS, and CDFW for review and to the CPM for review and approval. The description shall include the proposed construction schedule, a figure depicting the locations of proposed construction, and amount of acres of each habitat type to be disturbed.

No less than 30 days prior to beginning project ground-disturbing activities, the project owner shall provide the form of Security in accordance with this Condition of Certification in the amounts described in **BIO-29 - Table 3**. No later than seven days prior to beginning project ground-disturbing activities, the project owner shall provide written verification of the actual Security. The project owner, or an approved third party, shall complete and provide written verification of the proposed compensation lands acquisition within 18 months of the start of project ground-disturbing activities for each phase.

## **B. SOIL AND WATER RESOURCES**

### **DESCRIPTION OF MODIFICATIONS**

The modifications proposed in the Palen Solar Electric Generating System (PSEGS) petition (as more fully described in the **PROJECT DESCRIPTION** section of this Decision) include two 250-MW power-generating units, each consisting of a dedicated field of approximately 85,000 heliostats, a 750-foot solar tower and receiver, a power block, a natural-gas-fired auxiliary boiler, a natural-gas-fired night preservation boiler, a diesel-fired emergency fire pump system, a diesel-fired emergency electric generator system, a wet surface air condenser unit, an approximately 15-acre common facilities area (reduced from PSPP's 50 acre common facilities area) located in the southwestern corner of the site, with an administrative warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the PSPP). Additional equipment includes mirror washing machines, an approximately 203-acre temporary construction laydown area located in the southwestern portion of the site immediately north of the common facilities area, and a re-routed generation tie-line near the western end of the route and around the newly constructed Red Bluff Substation. The PSEGS project would eliminate the secondary emergency access road, reduce the project footprint from 4,366 acres to 3,794 acres, and reduce the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface. (Ex. 2000, p. 4.9-6.)

The PSEGS project reduces construction water consumption by approximately 80 percent from 5,750 acre feet per year (AFY) to 1,130 acre feet over 33 months. Operational water use would decrease by one-third from 300 AFY to 201 AFY. The PSEGS project would not require Land Treatment Units and would preserve natural drainage patterns for the majority of the site, instead of eliminating all on-site natural drainage as required in the PSPP. PSEGS would construct diversion channels to bypass storm water runoff only around power blocks and common facilities area instead of the three large drainage control channels to redirect all off site storm water runoff around the solar fields as originally designed for the PSPP. (Ex. 2000, p. 4.9-6.)

The following evidence on soil and water resources was received into evidence on October 28, 2013: Exhibits 1003, 1004, 1005, 1009, 1010, 1011, 1021, 1039, 1041, 1053, 1057, 1076, 2000, 2002, 2008, 3000, and 3001. (10/28/13 RT 292:14 – 294:5.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that with the implementation of the conditions of certification, the PSPP project would comply with all

applicable laws, ordinances, rules, and standards (LORS), and would not result in any unmitigated and significant direct, indirect or cumulative adverse impacts to soil or water resources.

Regarding soils, the Decision recognized that PSPP grading at the construction site would encompass approximately 4.5 million cubic yards of soil that would potentially result in short- and long-term erosion/sedimentation impacts. However, the PSPP Decision found that adherence to the procedures in conditions of certification (including the construction Drainage Erosion and Sedimentation Control Plan (DESCP), monitoring, drainage planning and reporting, flood modeling analysis, drainage design management, channel erosion protection and maintenance) would avoid significant soil erosion and subsequent sedimentation during construction and operation, conserve soil resources, maintain surface water quality, and prevent accelerated soil loss. The PSPP Decision also acknowledged potential short- and long-term adverse impacts to surface hydrology, storm water management and flooding from on-site grading and the construction and operation of a network of engineered collector/ conveyance channels. Again, the PSPP Decision found that implementation of conditions of certification (along with related conditions of certification identified in the **BIOLOGICAL RESOURCES** portion of the Decision) would reduce short- and long-term impacts to surface hydrology, storm water management, flooding, and surface water quality below a level of significance.

Regarding water supply, the PSPP was permitted to construct and operate up to 10 on-site groundwater supply wells that produce water from the Chuckwalla Valley Ground Water Basin (CVGB). The PSPP Decision recognized that PSPP would require approximately 1,917 AFY of groundwater extraction from the CVGB during the 39-month construction period, and approximately 300 AFY during operation, which could potentially result in significant impacts related to groundwater resources and subsidence in the CVGB and the adjacent Palo Verde Ground Water Basin (PVGB). The Energy Commission found that the implementation of conditions of certification, including redundant well construction oversight, protection of adjacent land owners' wells, groundwater use reporting, and subsidence monitoring would ensure that significant impacts to groundwater levels and subsidence in the CVGB would not occur. Further, the Decision imposed conditions of certification requiring analysis and mitigation to offset impacts to PVGB.

In analyzing impacts to groundwater quality, the PSPP Decision found that potential impacts related to groundwater quality during operation may have arisen from the use of on-site evaporation ponds, LTUs, septic systems, the use of local groundwater for domestic purposes (e.g., drinking water), and the potential induction of the vertical flow of high-saline groundwater from beneath Palen Dry Lake into aquifers used for water

production. However, based on the depth of the local groundwater table and the fact that a hazardous material management plan would be implemented during construction (under the **HAZARDOUS MATERIALS MANAGEMENT** portion of the Decision), the Energy Commission found that potential short-term impacts to groundwater quality would be less than significant. With implementation of conditions of certification requiring redundant oversight of well construction, compliance with LORS governing septic domestic discharge and specific groundwater monitoring, the Decision further found that long-term impacts related to groundwater quality were reduced below the level of significance.

The PSPP Decision found that after mitigation, cumulative impacts to soil, groundwater levels, groundwater quality, surface water hydrology, and surface water quality, were not cumulatively considerable. (PSPP Final Decision, CEC-800-2010-011, **SOIL AND WATER RESOURCES**, pp. 26 – 30.)

### **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

The Final Staff Assessment (FSA) of the PSEGS (Exhibit 2000) describes in detail the site's current setting and existing conditions regarding the project's soils, geology, geomorphology (transportation of sand dunes), the hydrogeology of the relevant ground basins (including inflow and outflow analysis), groundwater quality, a discussion of man-made wells in the area, surface water hydrology (including streams, seeps and springs) as well as storm water flow analysis. The FSA describes Staff's analytical methodology, relevant LORS, and the scope of the project during construction, operation and facility closure. Since the baseline soil and water conditions were established in the PSPP record and again in the FSA of the PSEGS, we incorporate by reference its descriptions of the existing baseline conditions at the PSEGS site. (Ex. 2000, p. 4.9-2 – 4.9-45.)

#### **Construction Impacts on Soil Erosion**

The PSEGS project represents a substantial reduction in potential soil loss compared to the PSPP project. The heliostat technology would not require an entirely flat surface that was needed for solar trough technology, so extensive grading would be avoided. The PSEGS project reduces the project footprint from 4,366 acres to 3,794 acres, a difference of 572 acres. The total earthwork proposed by the PSEGS project is 213,000 cubic yards, which is roughly five percent of the PSPPs 4,500,000 cubic yards of total earthwork. Although these differences would inherently reduce the grading impacts compared to the PSPP project, PSEGS' substantial changes in earthwork could potentially create issues that were not analyzed during assessment of the PSPP. Therefore, the FSA's soil erosion discussion is entirely independent of the analysis found in the Revised Staff Assessment for PSPP. (Ex. 2000, p. 4.9-46.)

Construction of the project is scheduled to last 33 months. Soil losses due to construction and grading activities would expose and disturb the soil and leave soil particles vulnerable to detachment by wind and water. Soil erosion results in the loss of topsoil and increases in sediment loading to nearby water resources. In the absence of proper Best Management Practices<sup>1</sup> (BMP), earthwork could cause significant fugitive dust and erosion. (Ex. 2000, p. 4.9-46.)

The magnitude, extent, and duration of those impacts would depend on several factors, including weather patterns in the vicinity of the PSEGS site, the types of soil that could be affected, and the method, duration, and time of year of construction activities. Prolonged periods of precipitation or high intensity and short duration runoff events, coupled with earth disturbance activities, could result in accelerated on-site erosion. In addition, high winds during grading and excavation activities could cause wind borne erosion leading to increased particulate emissions that adversely impact air quality. The implementation of appropriate erosion control measures would help conserve soil resources, maintain water quality, prevent accelerated soil loss, and protect air quality. (Ex. 2000, p. 4.9-46.)

The potential for erosion by water during construction is expected to increase as a result of the loss of vegetative cover, removal of surface crust, and increased local sediment transport through creation of localized gullies and rills on newly graded areas. The project owner submitted a Preliminary Draft Construction DESC/SWPPP that lists standard BMPs applicable to PSEGS construction activities along with drawings that show locations of specific BMPs at each power block, the common area, and temporary construction laydown area. In addition, the DESC identifies specific measures to reduce water-related erosion including:

- Temporary erosion control measures would be implemented on active and non-active disturbed areas prior to and at regular intervals throughout the defined rainy season, and year-round prior to storm events;
- Erosion in concentrated flow paths would be controlled by lining channels with a non-erodible material such as compacted riprap, geosynthetic matting, or engineered vegetation;
- Diversion berms (for example earth dikes) or drainage swales would redirect storm water run-on or on-site storm water flow around critical facilities or away from disturbed soil areas and stockpiles;

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<sup>1</sup> BMPs can be classified as "structural" (i.e., devices installed or constructed on a site) or "non-structural" (procedures such as modified landscaping practices). There are a variety of BMPs available, depending on pollutant removal capabilities.

- Disturbed areas would be stabilized with effective soil cover (such as aggregate, paving, or vegetation) as soon as feasible after construction or disturbance is complete and no later than 14 days after construction or disturbance in that portion of the site has temporarily or permanently ceased;
- Sediment controls would be implemented at the draining perimeter of disturbed soil areas, at the toe of slopes, and at outfall areas; and
- Stone filters and check dams would be strategically placed as needed throughout the project site to provide areas for sediment deposition and to promote the sheet flow of storm water prior to leaving the project site boundary. Where available, native materials (rock and gravel) would be used for the construction of the stone filter and check dams. Stone filters and check dams are not intended to alter drainage patterns but to minimize soil erosion and promote sheet flow. (Ex. 2000, p. 4.9-46.)

The Preliminary Draft DESCOP also includes a Monitoring and Reporting Program/Construction Site Monitoring Program to ensure performance standards and to monitor the effectiveness of BMPs. (Ex. 2000, p. 4.9-47.)

The Preliminary Draft DESCOP states that each area of the PSEGS project would be designed to provide the minimum requirements for access of installation equipment and materials. Most of the natural drainage features would be maintained and any grading required would be designed to promote sheet flow where possible. Solar fields and roads disturbed by grading or other ground disturbance would be protected from erosion by implementation of appropriate BMPs. Some of the measures listed would include:

- Existing vegetation would be preserved when feasible. Vegetation would be cut to a height that would not interfere with construction and operation of the heliostat fields, instead of clearing or grading the entire field;
- Clearing and grading activities would be restricted to areas where foundations, drainage facilities, and all-weather roads must be placed;
- Areas compacted during construction activities would be restored, as appropriate, to approximate preconstruction compaction levels to minimize the opportunity for any increase in surface runoff; and
- Effective sediment perimeter controls would be established and maintained at locations where runoff discharges offsite. (Ex. 2000, p. 4.9-47.)

The Preliminary Draft DESCOP also includes standard BMPs for Wind Erosion Control. The following practices were listed to minimize the loss of wind-blown soil from the site:

- Disturbed soil areas of the project site would be watered regularly to control dust and to maintain optimum moisture levels for compaction as needed, but to avoid runoff the areas would not be watered excessively. Sediment controls may be used at the edges of these areas as necessary to minimize sediment discharge;
- Areas of high erosion may require application of an approved palliative to reduce dust and prevent excess moisture on the road which may attract tortoises;
- At each structure site, the disturbed soil would be watered to form a crust following completion of construction in that location; and
- The construction site would post visible speed limit signs to prevent vehicles from traveling at excessive speeds. (Ex. 2000, p. 4.9-48.)

Staff reviewed the Preliminary Draft DESCPC and testified that BMPs during construction would reduce or avoid impacts to soil from erosion. To protect surface waters, standardized storm water and soil erosion BMPs have been determined by the State Water Resources Control Board (SWRCB) and RWQCBs to be the most effective practical means of preventing or reducing pollution from nonpoint sources. The conceptual plans for erosion control during construction appear reasonable, but there are additional elements that must be incorporated into the final DESCPC as required in Condition of Certification **SOIL & WATER-1**. The DESCPC shall reflect the most recent design plans of the proposed PSEGS project. If during the Energy Commission's amendment process any changes to the modified project are proposed, any adjustments that would alter the erosion control drawings, change the BMP strategy, or result in revised hydrology or hydraulic calculations must be reflected and addressed in an updated DESCPC. (Ex. 2000, p. 4.9-48.)

We find that compliance with an approved DESCPC accordance with Condition of Certification **SOIL & WATER-1** would reduce the impacts of soil erosion during construction. In addition, the project activities require that it be covered under the federal General Construction Permit (SWRCB Order No. 2009-0009-DWQ), which requires a construction SWPPP. Also, Conditions of Certification in the **AIR QUALITY** section of this PSA require a construction mitigation plan to prevent significant impacts from fugitive dust and wind erosion during construction. With the implementation of our conditions, BMPs and associated monitoring activities included in the approved DESCPC and SWPPP, impacts on soil would be less than significant during construction of the proposed PSEGS project. (Ex. 2000, p. 4.9-48.).

## Operational Impacts on Soil Erosion

Areas disturbed during the construction phase are subject to potential erosion during the 25 to 30 year operational life of the PSEGS project. (Ex. 2000, p. 4.9-48.)

The total area of land grading and excavation during construction of the PSEGS project is estimated to be about 752 acres. This total does not include the surface areas of all the heliostat mirrors because all-terrain vehicles would install pylons and mount heliostat assemblies. No grading would be required. After project completion, the temporary parking and construction laydown areas would be restored and about 25 acres would become impervious due to the addition of concrete foundations and asphalt paving. The balance of the previously-disturbed area, roughly 730 acres, would be susceptible to potential erosion during the operational life of the proposed project. Furthermore, the addition of impervious surfaces to an area previously undeveloped increases velocities of storm water runoff that increases the erosion potential of open soil areas. (Ex. 2000, p. 4.9-49.).

The project owner's Preliminary Draft DESCP/SWPPP proposed permanent erosion control measures that would reduce potential soil related impacts, including gravel, landscaping, and engineering drainage channels. These measures would affect stabilized areas with very little or essentially no risk of erosion. In addition, relatively small rock filters and local diversion berms through the heliostat fields would be required to discourage water from concentrating and to maintain sheet flow. These measures would serve to prevent wind and water erosion and maintain some water infiltration capacity of the soil. (Ex. 2000, p. 4.9-49.).

We find that implementation and maintenance of permanent BMPs during operations would reduce or avoid impacts to on-site soil from erosion and that compliance with Condition of Certification **SOIL & WATER-1** that would require the project owner to develop and implement an approved DESCP, along with the requirements regarding ground disturbing activities and erosion control measures specified in Condition of Certification **BIO-8**, would reduce the impacts of soil erosion during operation of the PSEGS project to below significance. Additionally, conditions of certification in the **AIR QUALITY** section of this FSA prevent significant impacts from fugitive dust during operations. (Ex. 2000, p. 4.9-49.)

Although modeling and calculations can be used to estimate post-construction flows and provide a basis for structural design parameters, alluvial flows are very complex. Flood flows from the mountains are initially confined in incised channels, but at the site the flood flows are broadly distributed (known as sheet flow) and less confined and can take random paths across the fan. Predicted flow depths and velocities have a potential uncertainty because they do not account for the dynamics of erosion and sedimentation

that can carry and deposit sediments at various locations along the margin of the alluvial fan where the site is located. Where obstructions such as heliostats and fences are encountered, flows can have erosive effects that could undermine their stability. The consequences of flash flood damage or modified sedimentation and erosion rates could be significant. However, we find Condition of Certification **SOIL & WATER-20** requiring a Storm Water Damage Monitoring and Response Plan would reduce these potential impacts to below significant levels. (Ex. 2000, p. 4.9-49.)

The PSEGS project's addition of impervious surfaces could also increase velocities of storm water runoff leaving its boundaries, possibly increasing the potential to erode off-site areas downstream of the project. To address the potential significant offsite erosion from storm damage, we impose Condition of Certification **SOIL & WATER-20** requiring a Storm Water Damage Monitoring and Response Plan to reduce these potential impacts in three ways. First, the project owner must establish an ongoing maintenance plan to ensure all storm water management measures are functioning properly through periodic inspection before the first seasonal storms and after each storm event throughout the year. Second, the project owner must establish and implement a response plan after every occurrence of damage (from a storm event or other cause) to clean up and repair damage to the berms. Third, the project owner must develop and implement a process to monitor incidents and propose modifications and/or improvements to address ongoing issues. (Ex. 2000, p. 4.9-50.)

We find that compliance with an approved DESCPC in accordance with Condition of Certification **SOIL & WATER-1** and an approved Storm Water Monitoring and Response Plan in accordance with Condition of Certification **SOIL & WATER-20** would reduce the impacts of soil offsite erosion during operation of the proposed project to below the level of significance. (Ex. 2000, p. 4.9-50.)

### **Mitigation for Construction and Operational Impacts on Soil Erosion**

The evidence indicates that construction and operation of the PSEGS project could result in significant impacts related to water erosion of soils. Implementation of BMPs and conditions of certification would reduce the impacts to insignificant levels. Implementation of Conditions of Certification **SOIL & WATER-1** and **SOIL & WATER-20**, in addition to conditions of certification required in the **AIR QUALITY RESOURCES** and **BIOLOGICAL RESOURCES** sections of this Decision, would ensure there would be no potential for significant impacts to soils related to water erosion. (Ex. 2000, p. 4.9-50.)

## **Construction and Operation Impacts on Geomorphology and Mitigation**

The combined sand corridor is a regionally significant geomorphic feature that transports sand downwind along the valley and to the Colorado River. The PSPP project would have intruded into the Chuckwalla Valley sand transport corridor by more than a mile cutting its width in half, and that would have created a “sand shadow” downwind; an area of current dune habitat where fine sand would be eroded downwind but not replaced from upwind, leading to loss of the sand dunes. Previous studies have shown that such sand shadows result in deflation (substrate coarsening and complete loss of Mojave Fringe Toed Lizard (MFTL) habitat within a few years (4-17 years). See the **BIOLOGICAL RESOURCES** section of this Decision for a detailed discussion of sand transport corridors. (Ex. 2000, p. 4.9-50.)

The PSEGS project eliminates the PSPP’s 30-foot-tall wind fence that contributed to disruption of the sand transport corridor. However, the PSEGS project would still have a project boundary fence (security fence) and desert tortoise exclusion fencing. Any fence design could impede sand transport and result in downwind impacts to sand dune habitat. In addition, sand that would have been transported across the project footprint from upwind would also be potentially cut off by storm drainage channels and diversion channels and above ground infrastructure that are proposed as part of the PSEGS project. A complete analysis of indirect impacts to sand transport corridors for the PSEGS project is included in the **BIOLOGICAL RESOURCES** section of this Decision. (Ex. 2000, p. 4.9-50.)

## **Construction and Operation Impacts on Groundwater Basin Balance**

The Final Decision allowed the PSPP to use up to 1,917 AFY during construction (for a total of 5,750 acre feet during the 39 months) and 300 AFY during operation drawn from up to 10 groundwater wells. The PSEGS project would utilize the same number of groundwater wells, but would only use up to 400 AFY during construction (for a total of 1,130 AFY during the construction period) and up to 201 AFY during operation. The wells would be used for process make-up water, mirror wash water, and domestic uses. Each solar plant would have a raw water tank with a capacity of 800,000 gallons. A portion of the raw water (200,000 gallons) is for plant use, while the majority would be reserved for fire water. The common area would also contain a combined service water/firewater tank with a capacity of 480,000 gallons. PSEGS would generate electricity up to 16 hours a day with the exception of a scheduled shutdown in winter for maintenance. However, the water treatment plant would operate continuously in order to minimize water treatment system size and capital cost, and to use off-peak energy at night. (Ex. 1003, p. 2-13.) As a result, the overall water use of PSEGS would be roughly half that of PSPP (7,160 AFY compared to 14,750 AFY). Because this reduction in groundwater use reduces the potential effects on groundwater basin balance, the

conditions of certification in the PSPP Decision, which fully mitigated the PSPP groundwater use, also fully mitigate PSEGS' groundwater use. (Ex. 2000, p. 4.9-53.)

A breakdown of the estimated average daily quantity of water required for PSEGS' operation is presented in **Soil and Water - Table 1**. The daily water requirements shown are estimated quantities based on PSEGS operating at full load. (Ex. 1003, p. 2-14.)

**Soil and Water - Table 1**  
**Average Daily Water Requirements (Both Solar Plants)**

Use	Average Daily Use		Annual Average Use
	GPD	GPM	AFY
Process Uses	63	90,873	102
Mirror Washing	44	63,408	71
Potable Water	2.1	2,995	3.4
Dust Suppression	15	21,802	24.4
<b>Total</b>	<b>124</b>	<b>179,078</b>	<b>201</b>

GPD = gallons per day

GPM = gallons per minute

AFY = acre feet per year

Average Daily Use is based on annual operating hours of 3,500 hours/year. (Ex. 1003, p. 2-14.)

The system would be designed to ensure higher pumping rates can be achieved for operational and emergency needs because usage rates would vary throughout the year and would be higher in the summer months. (Ex. 1003, p. 2-14.)

Water needs would be minimal because the facility would use air-cooled condensers. Primary water uses consist of replacing boiler blow-down, providing supplemental cooling for plant auxiliary systems and water for washing the heliostats to ensure they function at full performance. The frequency of mirror washing activities is anticipated to be greater at the PSEGS facility than at other proposed BrightSource facilities because the site is in a valley with the potential for high winds and near the location of a sand transport corridor. Regular mirror washing is anticipated to be needed once a week. Additional mirror washing may occur on an as-needed basis as determined by a

reflectivity monitoring program. Mirror washing would occur primarily at night and involves a water truck spraying treated water on the mirrors in a drive-by fashion. Wash water falls from the mirrors to the ground and, due to the small volume it soaks in with no appreciable runoff. Remaining rinse water from the mirror washing operation is expected to evaporate on the mirror surface. Water for domestic uses by project employees would also be provided by on-site groundwater treated to potable water standards. The estimated annual water use for this purpose is 4 AFY. (Ex. 1003, p. 2-14 – 2-15.)

We note that Intervenor Center for Biological Diversity (CBD) moved Exhibits 3000 and 3001 into evidence on the topic of soil and water resources. However, there is no testimony on soil and water resources at all in Exhibit 3000. Exhibit 3001 mentions state jurisdictional waters (which is covered in the **BIOLOGICAL RESOURCES** section of this Decision) and makes the following statement:

While the FSA states that ‘operational groundwater use is stated as 201 AFY, a reduction of nearly 100 AFY (at 4.2-3), this amount of ground water is much more than the 140 AFY of groundwater identified for the operational groundwater use of the very similar Hidden Hills Solar Electric Generating System (HHSEGS) in that project’s FSA (at pg. 4.14-26). It is unclear to me why such a similar project design would require additional groundwater pumping, particularly when water is such a precious resource in the arid Colorado Desert. (Ex. 3001, p. 17.)

CBD’s expert raised this same concern at the evidentiary hearing. (10/28/13 RT 276:23 – 277:12.) Petitioner’s expert explained at the evidentiary hearing that the meteorological conditions, particularly wind, caused an increase in water usage. (10/28/13 RT 278:14 – 279:5; 280:6-10.)

Staff took the position that the PSEGS’ substantial reduction of water consumption using the same water supply as the PSPP did not constitute a project change from the approved PSPP. (Ex. 2000, p. 4.9-51; 10/28/13 RT 279:10 - 17.) We agree that for purposes of this amendment there would be no difference in the analysis of the Groundwater Basin between the PSPP and the PSEGS. The Reduced Acreage Alternative would further reduce project water consumption.

### **Mitigation of Construction and Operational Impacts on Groundwater Basin Balance**

As described in the PSPP Decision, there is a potential that groundwater production at the project site may induce additional inflow from the Colorado River, which would be a significant impact. Condition of Certification **SOIL & WATER-14** requires development of a Water Supply Plan that includes water conservation projects such as payment for irrigation improvements in the Palo Verde Irrigation District, purchase of water rights

within the Colorado River Basin that would be held in reserve, and/or participation in the BLM's Tamarisk Removal Program. Implementation of the Condition of Certification **SOIL & WATER-14** will reduce the potential for impacts to the Colorado River to below the level of significance. The project owner may elect to conduct the analysis described in Condition of Certification **SOIL & WATER-17** to refine the quantity of water contributed by the Colorado River from PSEGS groundwater extraction. Because the modified PSEGS project would use a reduced amount of water during both construction and operation activities with the same proposed groundwater supply system as the approved PSPP project, we find that Conditions of Certification **SOIL & WATER-14** and **SOIL & WATER-17** as approved in the PSPP Decision would also apply to the PSEGS project. (Ex. 2000, p. 4.9-54 – 4.9-55.)

### **Construction and Operation Impacts on Groundwater Levels**

We find that there is no project change regarding groundwater levels from the PSPP, because the PSEGS project would use a substantially reduced amount of water during both construction and operation activities with the same proposed groundwater supply system as the approved PSPP project. (Ex. 2000, p. 4.9-55.)

The maximum predicted water table draw-down associated with the PSPP project was approximately 7 to 11 feet in the area of the pumping and the area where draw-down exceeds 1 foot is limited to within approximately 1 to 3 miles of the project ROW. (Ex. 2000, p. 4.9-56.)

The nearest potential wetland or halophyte communities are near Palen Dry Lake. Groundwater dependent vegetation lies approximately 3-6 miles from the project site. The record estimates the groundwater level decline to be approximately 0.2 to 0.6 feet of decline by the end of operations (33 years). The **BIOLOGICAL RESOURCES** section of this Decision describes potential impacts to vegetation that may be dependent on shallow groundwater table conditions. (Ex. 2000, p. 4.9-57.)

Given the current understanding of the hydrogeology of the Quaternary Alluvium, the Bouse Formation and the Fanglomerate, as well as the current understanding concerning existing wells that may be affected by project-induced draw-down, it is unlikely that groundwater pumping for the project would cause any nearby wells to go dry or be severely impaired or rendered unusable by declining groundwater levels. However, groundwater levels would decline and could affect nearby wells. While preliminary studies and calculations have been made to assess the potential for impact, the quantification of the impact is considered an estimate and cannot be accurately quantified until actual long-term groundwater production occurs. Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-5** minimize impacts to groundwater levels to below the level of significance. (Ex. 2000, p. 4.9-57.)

## **Mitigation of Construction and Operational Impacts on Groundwater Levels**

Groundwater levels near the project's water supply wells would decline during the project pumping. Local decline of groundwater levels within the cone of depression could affect nearby wells. Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-5** have been found to minimize impacts to groundwater levels to below the level of significance. These conditions which regulate well construction, limit the quantity of water use, monitor groundwater levels, and mandate compensation for well impacts are effective in addressing any impacts to nearby wells that may occur as a result of project pumping. (Ex. 2000, p. 4.9-58.)

The project must implement Condition of Certification **SOIL & WATER-16** that requires a Subsidence Monitoring and Action Plan to assess and mitigate potential effects of non-elastic subsidence associated with groundwater extraction in the vicinity of the production wells. (Ex. 2000, p. 4.9-58.)

Because the modified PSEGS project would use a reduced amount of water during both construction and operation activities with the same proposed groundwater supply system as the approved PSPP project, we find that Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-5** and **SOIL & WATER-16** as approved in the Commission Decision would also mitigate the PSEGS project's impacts to groundwater levels to below significance. (Ex. 2000, p. 4.9-58.)

## **Construction Impacts on Groundwater Quality**

Here, again, we find that there is no project change regarding groundwater levels from the PSPP because the PSEGS project would use a substantially reduced amount of water during both construction and operation activities with the same proposed groundwater supply system as the approved PSPP project. Additionally, the PSEGS project would use a reduced number of evaporation ponds using the same type proposed for the approved PSPP project. Therefore, the following groundwater quality discussion has been included in this analysis to explain the basis for imposing the conditions of certification. (Ex. 2000, p. 4.9-59.)

There is a potential that significant groundwater quality impacts could occur during construction if contaminated or hazardous materials used during construction were to be released and migrate to the groundwater table. However, impacts to groundwater quality have been found to be below the level of significance because of the great distance to the groundwater table (180 feet bgs), the elimination of the use of heat transfer fluid, and the proposed implementation of a hazardous material management plan during construction (as required by Conditions of Certification **HAZ-1** and **HAZ-2** in the **HAZARDOUS MATERIALS MANAGEMENT** section of this Decision). (Ex. 2000, p. 4.9-59.)

The PSPP AFC record disclosed a potential that project extraction of groundwater could induce vertical flow of high saline groundwater from beneath Palen Dry Lake to lower aquifers (being used for water production) located beneath the site. At the present time, no significant differential in groundwater quality has been identified beneath the project. The PSPP record indicated that variable values of hydraulic conductivity based on site specific data, it would take between about 43 years to 4,424 years for groundwater to flow from beneath Palen Dry Lake to the project wells. Accordingly, the evidence showed that it is unlikely that significant vertical migration of poor quality water would migrate and degrade higher quality portions of the aquifer. However, due to the uncertainty associated with the amount of information available concerning shallow groundwater quality and vertical migration, Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-4** and **SOIL & WATER-18** would be imposed. These conditions, which regulate well construction, limit the quantity of water use, and monitor groundwater quality, would reduce impacts to groundwater quality to below the level of significance. (Ex. 2000, p. 4.9-59.)

Because the PSEGS project uses a reduced amount of water during construction with the same proposed groundwater supply system as the approved PSPP project, we find that Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-4** and **SOIL & WATER-18**, as approved in the PSPP Decision, would also mitigate the PSEGS project's impacts. (Ex. 2000, p. 4.9-59.)

### **Operational Impacts on Groundwater Quality**

Groundwater extraction during operation has the same impact potential to induce vertical flow of high saline groundwater from beneath Palen Dry Lake to lower aquifers as project extraction of groundwater during construction (described above). Again, since the PSEGS project would use a reduced amount of water during operation activities with the same proposed groundwater supply system as the approved PSPP project, we find that Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-4** and **SOIL & WATER-18**, as approved in the PSPP Decision, would also fully mitigate the PSEGS project to below the level of significance. (Ex. 2000, p. 4.9-60.)

The approved PSPP project would have had four double-lined evaporation ponds. Each pond would have had an evaporative surface area of four acres resulting in a total of eight acres of evaporation ponds for each unit or a total of 16 acres of ponds for the entire approved PSPP project. The PSEGS project would instead construct two double-lined evaporation ponds, each with two acres of evaporative surface area resulting in a total of four acres of ponds for the entire project. (Ex. 2000, p. 4.9-60.)

The ponds would be designed and permitted as Class II Surface Impoundments in accordance with Colorado River Basin Regional Water Quality Control Board

(CRBRWQCB) requirements, as well as the requirements of California Department of Resources Recycling and Recovery (CalRecycle). Multiple ponds are planned to allow plant operations to continue in the event that a pond needs to be taken out of service for needed maintenance. Each pond would have enough surface area so the evaporation rate exceeds the input rate at maximum design conditions and annual average conditions. (Ex. 2000, p. 4.9-60.)

The PSEGS ponds would be six feet deep. There would be no need for periodic removal of solids over the 30-year life of the facility. Ponds are designed for an ultimate salt depth of 3.2 feet and a maximum water depth of 1.0 feet. A 100-yr, 24-hour storm event is estimated by NOAA to yield 0.4 feet (4.22 inches) of rain. A minimum freeboard of 1.0 foot would be maintained during the life of the ponds (Ex. 2000, p. 4.9-61.)

The pond liner system would consist of a 60-mil-high density polyethylene (HDPE) primary liner and a secondary 40 mil HDPE liner. Between the liners is a synthetic drainage geonet and collection piping that is used as part of the leachate detection system, which would be directed back to the pond. There would be a hard surface protective layer on top of the 60 mil HDPE which would consist of a hard surface such as roller-compacted concrete. The hard surface provides protection against accidental damage to the HDPE from falling objects, varying climatic conditions, and worker activities during cleanout and maintenance. Monitoring of the evaporation ponds is required to detect the presence of liquid and/or constituents of concern. Although the PSEGS would create less process wastewater per year compared to the PSPP, the constituents of concern would occur in higher concentrations. Due to the waste discharge safeguards contained in Condition of Certification **SOIL & WATER-6** along with Condition of Certification **SOIL & WATER-18**, we find that there would be no significant impacts to groundwater quality as a result of disposal of this waste stream. (Ex. 2000, p. 4.9-61.)

The PSEGS would no longer use a land treatment unit to treat accidental spills of heat transfer fluid (HTF) simply because the amendment eliminates the use of HTF and obviates the requirement. The project would continue to use septic fields. The use and application of septic fields is an established practice as a method of wastewater treatment. The septic system would have no affect on the surface water in or around the project site. The septic system would be installed approximately 5-6 feet deep. In addition, the Riverside County Department of Environmental Health requires a setback of 100 feet between this type of system and the nearest groundwater well. (Ex. 2000, p. 4.9-63.)

Individual septic systems and leach fields are planned for each of the two power blocks and the projects' administrative, warehouse, control room, and facilities. The proposed septic systems and leach fields for the various facilities are hydraulically down-gradient

from the nearest offsite well. Therefore, operation of the septic systems and leach fields from these areas would not impact groundwater quality at the nearest offsite wells. (Ex. 2000, p. 4.9-64.)

The septic system and leach fields for the project would be constructed in accordance with the requirements of Riverside County and Condition of Certification **SOIL & WATER-7**, including Ordinance 650.5, which regulates the discharge of sewage in unincorporated areas of the County of Riverside; title 15, section 15.24.010 (the Uniform Plumbing Code), appendix K; title 8, section 8.124.030 (approval and construction permit for sewage discharge; and section 8.124.050 (operation permit for sewage disposal). (Ex. 2000, p. 4.9-64.)

The PSEGS project would employ a comparable number of full-time workers during operation as the approved PSPP project. The PSPP project estimated 134 full time employees and the PSEGS project estimates up to 100 full-time employees. Therefore, regarding the planned septic system, we find that Condition of Certification **SOIL & WATER-7**, as approved in the PSPP Decision, would also apply to the PSEGS project. (Ex. 2000, p. 4.9-64.)

#### **Mitigation for Construction and Operational Impacts on Groundwater Quality**

Groundwater quality in the vicinity of the PSEGS site could be impacted as a result of the operation of the surface evaporation impoundments and septic fields. The record contains studies and calculations that assess the potential for impact. These studies suggest that there is a low potential to impact groundwater quality in the vicinity of the project site. Due to the uncertainty associated with the potential to impact groundwater quality and the regulatory requirements for operation of the surface evaporation impoundments and septic systems, we would again impose Conditions of Certification **SOIL & WATER-6**, **SOIL & WATER-7** and **SOIL & WATER-18** to minimize impacts to groundwater quality to below a level of significance. (Ex. 2000, p. 4.9-65.)

#### **Construction and Operation Impacts on Surface Water Hydrology**

The PSEGS project introduces substantial changes to the site hydrology compared to the PSPP. The PSEGS project removes the three major drainage channels that were designed to route the water through and around the PSPP's entire field of solar troughs. Instead, the PSEGS heliostat technology allows most flows to maintain existing pre-project natural drainage patterns through the solar fields. Because the PSEGS project does not propose the major drainage channels, we would remove Conditions of Certification **SOIL & WATER-8** through **SOIL & WATER-12**. (See "**CONDITIONS OF CERTIFICATION**" below.) Although these differences would inherently reduce the impacts of water diversion compared to the PSPP project, these changes in hydrology could potentially create issues that were not analyzed during assessment of the PSPP

project. However, the record contains surface water hydrology evidence that is entirely independent of the analysis supporting the Commission's Decision for the PSPP. (Ex. 2000, p. 4.9-65.)

Construction of the PSEGS project would alter existing on-site drainage patterns that could potentially cause or increase on-site flooding. For the majority of the project site, existing drainage patterns would generally remain the same. However, changes to a number of areas such as grading, adding impervious surfaces, diverting flows, and impeding flows can increase the amount of storm water runoff volume and rate. (Ex. 2000, p. 4.9-66.)

Heavy to medium grading would be performed within each solar plant's power block area and the common area complex. Grading would also be needed to create a system of roadways for access to each facility and maintenance of the heliostats, although grading in the solar fields would match natural contours and promote sheet flow where possible. The estimated amount of total grading (both temporary and permanent) would be about 413 acres. After project completion, the temporary parking and construction laydown areas would be restored to pre-project grade and stabilized to prevent erosion and promote natural re-vegetation. (Ex. 2000, p. 4.9-66.)

While most of the permanently graded area would remain "dirt" surface, the addition of concrete foundations and asphalt paving would create approximately 25 acres of impervious surface. Since water is not able to infiltrate into impervious surfaces, storm water runoff quickly concentrates and flows downstream, increasing both the volume and velocity of accumulated water. In addition, the heliostat assemblies would essentially function as thousands of rooftops and create approximately 799 acres of impervious surfaces covering about 21 percent of the project site. However, impacts are considerably less severe than a contiguous stretch of impervious area because the heliostats' surface runoff would flow to the pervious dirt areas of the solar field. (Ex. 2000, p. 4.9-66.)

Staff acknowledged that the project owner has completed a thorough hydrologic analysis, but noted that predicted flow depths and velocities on undeveloped alluvial fans have potential uncertainty. The consequences of flash flood damage or modified sedimentation and erosion rates could be significant. Therefore, we would impose Condition of Certification **SOIL & WATER-20** (Storm Water Damage Monitoring and Response Plan) to reduce potential impacts caused by a large storm event in four ways:

First, the project owner must establish specifications for heliostat installation based on site specific studies and reports (e.g. a pylon insertion depth and a heliostat stability report). This ensures that heliostats are designed to withstand storm water scour of a 100-year storm event. Second, the project owner must establish an ongoing

maintenance plan to ensure all storm water management measures are functioning properly through periodic inspection before the first seasonal storms and after each storm event throughout the year. Third, the project owner must establish and implement a response plan to clean up damage and prevent release of sediment or pollutants after every occurrence of damage from a storm event or other cause. Fourth, the project owner must develop and implement a process to monitor incidents and propose modifications and/or improvements to address ongoing issues. (Ex. 2000, p. 4.9-66 - 4.9-67.)

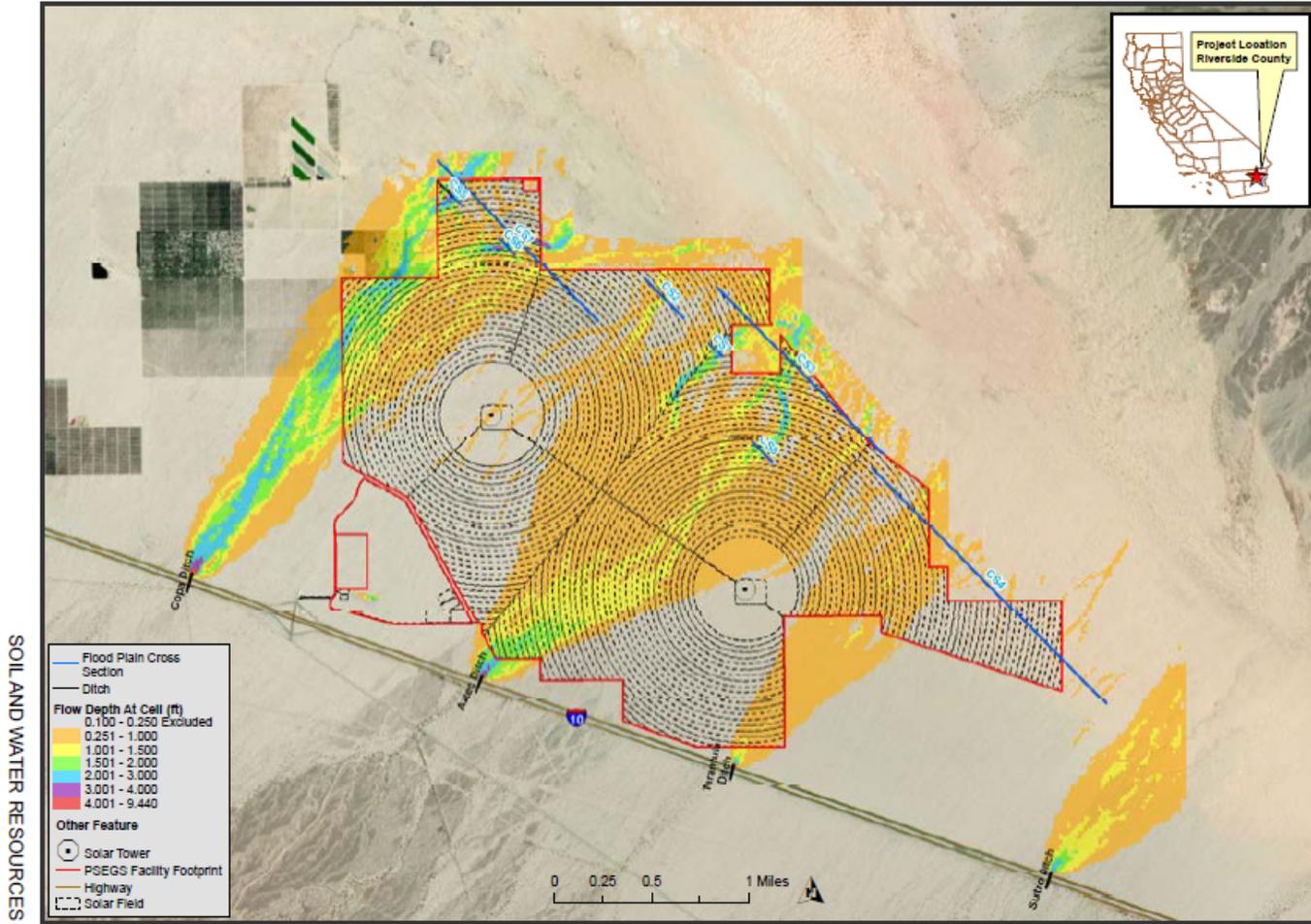
Furthermore, as the PSEGS project plans evolve from the conceptual and preliminary phases, any changes affecting hydrology or hydraulics would require an updated comprehensive analysis for purposes of **SOIL & WATER-20**, for example, the use of certain commercial dust suppressants applied onto dirt roads that would increase the total impervious area of the site. (Ex. 2000, p. 4.9-67.)

In addition, standing water on site might have impacts to biological resources given the scarcity of water in the desert. For example, standing water has the potential to attract nuisance predators such as ravens to the site. (See the **BIOLOGICAL RESOURCES** section of this for further discussion on the potential impacts of standing water to biological resources and possible mitigation required.) (Ex. 2000, p. 4.9-67.)

In three areas (Solar Plant 1, Solar Plant 2, and the administration building), permanent diversion channels would be constructed to redirect storm runoff around these structures and prevent damage from flooding that occurs naturally due to existing topography. The diversion channels around the administration building and each solar block would protect these structures from natural ephemeral flooding. Although the administration building and solar blocks are generally located outside these flooded areas (see **Soil & Water Resources - Figure 1**), desert washes can be transient and may vary in course from one storm event to another. Additional temporary diversion channels may also redirect flows around construction laydown and temporary parking areas during the construction activities of the project. Because of the general flow-through design of the solar fields, the diversion channels would not redirect runoff flows in a way that would adversely flood other areas either on site or off site. Also, Condition of Certification **SOIL & WATER-20** (Storm Water Damage Monitoring and Response Plan) requires maintenance and monitoring of diversion channels during operations for added protection against storm damage. (Ex. 2000, p. 4.9-66.)

# Soil & Water Resources - Figure 1

Palen Solar Electric Generating System - Post Construction Depth Map (24-hour 100-year storm)



CALIFORNIA ENERGY COMMISSION, SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION  
SOURCE: BrightSource, Bing Aerial

Numerous ephemeral drainages flow through the proposed PSEGS site originating from the southwest and discharging to the northeast toward the Palen dry lake bed. Due to the episodic rainfall of the region and transient nature of the drainages, off-site flows can easily exceed these shallow channels and result in flooding. Proposed grading and construction of PSEGS would increase the amount of impervious area on site. This would increase the amount of storm water peak discharge leaving the site and could exacerbate the naturally occurring floods downstream of the site. (Ex. 2000, p. 4.9-68.)

The project owner submitted a “Developed Conditions Drainage Assessment” that modeled post-construction on-site peak flows, runoff volumes, maximum velocities, and maximum depths of potential floods. The analysis represented post-construction site conditions and included in the analysis impervious surfaces (heliostats, buildings, asphalt roadways and parking lots), and graded dirt roads. (Ex. 2000, p. 4.9-69.)

The evidence shows that the impacts of off-site downstream floods would be reduced because the peak discharge of the 100-year, 24-hour storm event leaving the site during post construction conditions would be very close to discharge of preconstruction conditions. Staff acknowledged that the project owner has completed a thorough hydrologic analysis, but noted that predicted flow depths and velocities on undeveloped alluvial fans have potential uncertainty. The consequences of flash-flood damage or modified sedimentation and erosion rates could be significant. Therefore, we impose Condition of Certification **SOIL & WATER-20** requiring a Storm Water Damage Monitoring and Response Plan to reduce these potential impacts. (Ex. 2000, p. 4.9-69.)

The evidence shows that the PSEGS is not located within the 100-year flood plain as defined by FEMA and is located roughly 150 miles inland with no dams in the region. In addition, no levees or inland bodies of water are located in the area. The PSEGS project would not impede or significantly redirect flood flows of the FEMA designated 100-year floodplain. Also, PSEGS would not be affected by dam failure, tsunami, or seiche. We find PSEGS would not have significant impacts to any of these identified flood hazard areas. (For discussion on additional potential hazards that could be caused by soil failure such as mudflow, landslide and liquefaction, see the **GEOLOGY AND PALEONTOLOGY** section of this Decision.) (Ex. 2000, p. 4.9-70.)

### **Mitigation for Construction and Operational Impacts on Surface Water Hydrology**

The Implementation of Conditions of Certification **SOIL & WATER-1** DESCP and **SOIL & WATER-20** (Storm Water Damage Monitoring and Response Plan) would minimize impacts related to flood hazards and erosion associated with construction and operation of the modified project to below the level of significance. (Ex. 2000, p. 4.9-70.)

At the evidentiary hearing, CBD’s expert asked whether there was a condition of certification that required waters discharging from the PSEGS site to “mimic the off-site

existing hydrology so there [would be no] downstream impacts.” (10/28/13 RT 280:23 – 281:5.) Staff’s expert testified that the PSEGS “mimics” the off-site hydrology much closer than the PSPP. (10/28/13 RT 283:13 – 21.) Staff’s expert went on to explain how the conditions of certification work together to prevent impacts from water discharging from the site. (10/28/13 RT 282:11 – 285:14.) Conditions of Certification **SOIL & WATER-1**, **SOIL & WATER-6** and **SOIL & WATER-20** reduce the potential storm damage caused by water leaving the site which reduces the potential for impacts to surface water hydrology to less than significant.

### **Construction Impacts on Surface Water Quality**

The project storm water runoff may encounter soil or chemicals deleterious to aquatic and terrestrial plant and wildlife. The project owner would implement BMPs for managing potentially harmful storm water and protect water quality. Potentially significant water quality impacts could occur during construction and operations if contaminated or hazardous materials containing trace oil, chemicals, metals, toxic substances, or other materials were to contact storm water. Contact runoff could concentrate various pollutants that would then discharge to an off-site water resource. The PSEGS would alter natural storm water drainages around the common area and around each solar power block. (Ex. 2000, p. 4.9-70.)

Potential threats to surface water quality related to construction includes potential increases in sediment loads to adjacent streams and washes, and accidental spills of hydrocarbon fuels and greases associated with construction equipment. The SWRCB and CRBRWQCB have determined that standardized storm water and soil erosion BMPs are the most effective practical means to protect surface waters by preventing or reducing pollution from nonpoint sources. The evidence confirms that carefully chosen BMPs for both construction and operation activities would effectively prevent or reduce sediment discharge into water resources. Potential increased sediment loads would be mitigated through development and implementation of a DESC, which is required as part of Condition of Certification **SOIL & WATER-1**. (Ex. 2000, p. 4.9-70.)

To prevent contact runoff from discharging off site during construction activities, the project owner has identified a combination of standard BMPs within the DESC for pollution control measures to be implemented during construction. The BMPs limit or reduce potential pollutants at their source before they come into contact with storm water. These BMPs also involve daily activities of the construction site, are under the control of the construction contractor, and are additional “good housekeeping practices,” which involve maintaining a clean and orderly construction site. (Ex. 2000, p. 4.9-67.)

Accidental spills of hydrocarbon fuels and greases associated with construction equipment would also be mitigated by the development and implementation of

Conditions of Certification **HAZ-1** and **HAZ-2** contained in the **HAZARDOUS MATERIALS MANAGEMENT** section of this Decision, which includes development of a Spill Prevention, Control and Countermeasure (SPCC) Plan. The SPCC plan sets forth spill prevention methods as well as actions to be taken in the event of an accidental spill or release of hazardous materials. In summary, implementation of BMPs as defined in Condition of Certification **SOIL & WATER-1** and Conditions of Certification **HAZ-1** and **HAZ-2** reduce potential surface water quality impacts during construction to insignificant. (Ex. 2000, p. 4.9-71.)

### **Operational Impacts on Surface Water Quality**

Potential threats to surface water quality related to operations includes: potential increases in sediment loads to adjacent washes; accidental spills of hydrocarbon fuels and greases associated with operations equipment; and accidental releases from the surface impoundments that include process wastewater. (Ex. 2000, p. 4.9-71.)

To prevent the discharge of untreated industrial wastewater or untreated sanitary wastewater from entering nearby water resources, each PSEGS solar plant would keep the potentially polluted waste water (contact runoff, general facility drainage, process wastewater, and sanitary waste) completely separated from non-contact storm water runoff. Sanitary waste would remain contained within the septic system. Industrial wastewater would remain within the power block, be processed through the thermal evaporator system and then disposed into the evaporation ponds. Hazardous liquids would be handled to prevent spills and accidental release. Non-contact storm water would be directed away from the power blocks and allowed to flow offsite toward the northeast. All BMPs and conditions of certification would strive to prevent any chemical or hazardous pollutants from mixing with the "clean" storm water. With the implementation of these measures, impacts from sanitary or industrial wastewater would be avoided or reduced to below significance during operation of the PSEGS project. (Ex. 2000, p. 4.9-71.)

A DESCP would be required (see Condition of Certification **SOIL & WATER-1**) prior to on-site operations, which would reduce the potential for increased sediment loads to less than significant. Potential spills would be managed through hazardous materials management (see the **HAZARDOUS MATERIALS MANAGEMENT** section of this Decision). The operation of the surface impoundments requires one foot of freeboard to minimize the potential for overtopping during a 100-year precipitation event. In addition, the surface impoundments operate under the waste discharge requirements that include operational and leak detection monitoring as stipulated in **SOIL & WATER-6**. Also, **SOIL & WATER-20** reduces the potential of pollutants caused by storm damage from leaving the site, which reduces the potential for impacts to surface water quality to less than significant. (Ex. 2000, p. 4.9-72.)

## **Mitigation for Construction and Operational Impacts on Surface Water Quality**

No significant impacts are anticipated related to surface water quality. Implementation of Conditions of Certification **SOIL & WATER-1-6**, and **-20**, and **HAZ-1** and **-2** would reduce impacts to surface water quality to below the level of significance associated with construction and operation of the PSEGS project. Additional requirements for mitigation of potential surface water quality impacts are included as a part of the waste discharge requirements for the surface impoundment in Condition of Certification **SOIL & WATER-6**. (Ex. 2000, p. 4.9-72.)

## **Non-Operation and Facility Closure Impacts and Mitigation**

PSEGS is designed for an operating life of 25 to 30 years. Operations can cease as a result of two types circumstances: (1) the facility is closed suddenly and/or unexpectedly because of unplanned events such as a natural disaster or economic forces, or (2) the facility is closed in a planned, orderly manner, such as at the end of its useful economic or mechanical life or due to gradual obsolescence. As described in the **GENERAL CONDITIONS** section of this Decision, "non-operation" is time-limited (planned or unplanned) that can encompass part or all of the facility, and "closure" is a facility shutdown with no intent to restart operation. (Ex. 2000, p. 4.9-78.)

In the event of a temporary closure, PSEGS would be required to comply with all applicable conditions of certification including a Site Contingency Plan (see Condition of Certification **COM-12**). Depending on the expected duration of the shutdown, appropriate measures would be taken such as removing chemicals from storage tanks or equipment. (Ex. 2000, p. 4.9-78.)

Permanent closure requires compliance with a Facility Closure Plan (see Condition of Certification **COM-15**), which would be submitted to the Energy Commission for approval three years prior to actual closure. Future circumstances that could affect permanent closure are largely unknown at this time; however, compliance with all applicable LORS and any local and/or regional plans would be required. The plan would address all concerns in regard to potential erosion and impacts on water quality as described in Condition of Certification **SOIL&WATER-13**. Compliance with the Facility Closure Plan would reduce any potential impacts below significance. Refer to the **GENERAL CONDITIONS** section of this FSA for further discussion on temporary and permanent facility closure. (Ex. 2000, p. 4.9-78.)

## **CUMULATIVE IMPACTS**

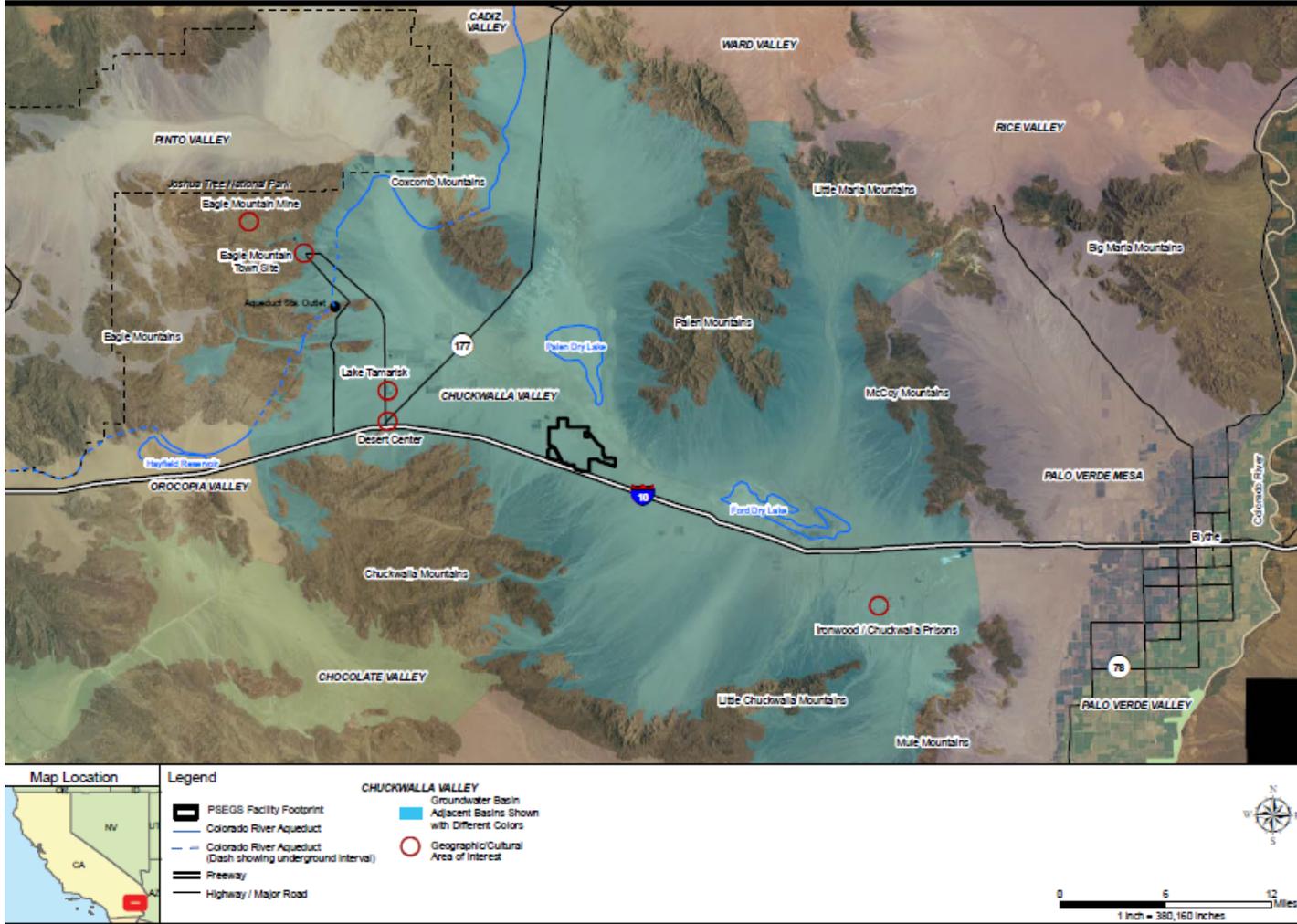
A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects

of past projects, the effects of other current projects, and the effects of probable future projects (California Code of Regulations, title 14, section 15130).

As identified in the **PROJECT DESCRIPTION** section of this Decision, a number of projects within the region of the PSEGS have been approved, are under review or in operation (see **PROJECT DESCRIPTION - Tables 2, 3 and 4**). The geographic extent used as part of the cumulative impact assessment for soil and water resources includes the CVGB. The extent of the basin is described fully in the record and shown in **Soil & Water Resources - Figure 2**. (Ex 2000, p. 4.9-72.)

## Soil & Water Resources - Figure 2

Palen Solar Electric Generating System - Chuckwalla Valley Regional Groundwater Basins



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION  
SOURCE: AECOM 2010

Foreseeable projects that may impact the soil and water resources of the area were deemed to include only those projects located in the CVGB. **Soil & Water Resources - Table 2** lists the foreseeable projects analyzed for cumulative impacts. (Ex. 2000, p. 4.9-73.)

**Soil & Water Resources - Table 2  
Foreseeable Projects and Anticipated Water Use**

Project	Label ID	Use	Water Use – Foreseeable Projects (AFY)									Ref
			2014	2015	2016	2017	2018	2019	2020	2021	2022–2046	
Eagle Mountain Pumped Storage	6	Construction	—	308	308	8066	8066	8066	8066	—	—	Final EIR
		Operation	—	—	—	—	—	—	—	2688	1763	
Desert Sunlight	3	Construction	—	—	—	—	—	—	—	—	—	Final EIS
		Operation	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Desert Harvest Solar	7	Construction	450	450	—	—	—	—	—	—	—	Final EIS
		Operation	33	33	33	33	33	33	33	33	33	
Desert Lily Soleil	8	Construction	20	20	—	—	—	—	—	—	—	Estimates
		Operation	—	—	5	5	5	5	5	5	5	
Chuckwalla Valley Raceway	9	Construction	11	—	—	11	—	—	—	—	—	Estimates
		Operation	3	3	3	3	3	3	3	3	3	
Chuckwalla Solar I	12	Construction	20	20	10	—	—	—	—	—	—	Estimates
		Operation	—	5	7	10	10	10	10	10	10	
Genesis Solar Energy	16	Construction	—	—	—	—	—	—	—	—	—	Energy Commission Final Decision
		Operation	202	202	202	202	202	202	202	202	202	
Mule Mountain enXco	18	Construction	20	20	—	—	—	—	—	—	—	Estimates
		Operation	—	—	10	10	10	10	10	10	10	
Mule Mountain Solar	26	Construction	20	20	20	—	—	—	—	—	—	Estimates
		Operation	—	—	—	1	1	1	1	1	1	
Milpitas Wash	31	Construction	10	10	—	—	—	—	—	—	—	Estimates
		Operation	—	—	1	1	1	1	1	1	1	
PSEGS		Construction	400	400	400	—	—	—	—	—	—	
		Operation	—	—	—	201	201	201	201	201	201	
<b>TOTALS (REVISED)</b>			<b>1189</b>	<b>1491</b>	<b>999</b>	<b>8543</b>	<b>8532</b>	<b>8532</b>	<b>8532</b>	<b>3154</b>	<b>2229</b>	
PSPP RSA TOTALS			3352	2963	2955	9905	9905	9905	9905	4527	3602	

(Ex. 2000, pp. 4.9-73 – 4.9-74.)

The construction of the PSEGS project is expected to result in short-term adverse impacts related to construction activities. Some of the cumulative projects that are not yet built may be under construction at the same time as the PSEGS project. In addition, it is possible that some of the future and foreseeable projects may be operational at the same time as the PSEGS project. As a result, there may be substantial long-term cumulative impacts during construction and operation of these projects related to soils and water resources. These impacts may include soil erosion, geomorphology, changes in the groundwater basin balance, groundwater levels, and groundwater quality, and changes in surface water hydrology and surface water quality. (Ex. 2000, p. 4.9-73.)

Construction of the PSEGS would result in both temporary changes at the project site that could incrementally increase local soil erosion and storm water runoff during construction. The PSEGS would contribute only a small amount to the possible short term cumulative impacts related to soil erosion because the project owner would be required to implement the conditions of certification defined in this analysis, which would bring short-term impacts to below the level of significance. (Ex. 2000, p. 4.9-74.)

Operation of the PSEGS would result in permanent changes at the project site. These changes could incrementally increase local soil erosion and storm water runoff. However, the PSEGS would not contribute to these possible long term operational cumulative impacts because potential project-related soil erosion and increased sedimentation resulting from storm water runoff would be reduced to a level of insignificance through implementation of the conditions of certification specified below. (Ex. 2000, p. 4.9-74.)

There is a concern that implementation of all of the foreseeable projects could have a cumulative impact on the regionally significant geomorphic processes that transport sand downwind along the Chuckwalla Valley and to the Colorado River. Blocking or disrupting the sand transport corridors would impact various sites that provide habitat for biological resources such as the Mojave Fringe-Toed Lizard. See the **BIOLOGICAL RESOURCES** section of this Decision for further analysis of potential cumulative impacts related to geomorphic processes. (Ex. 2000, p. 4.9-74.)

The evidence includes an evaluation of whether the amount of groundwater used for both construction and operations would place the groundwater basin into overdraft and deplete the CVGB. For purposes of impact analysis, we assume that any withdrawals that exceed the average natural recharge and exceed a significant percentage of the total amount of groundwater in storage would be a significant impact. **Appendix G** of the CEQA Guidelines refers to “[substantial interference] with groundwater recharge such that there would be a net deficit in aquifer volume.” (Ex. 2000, p. 4.9-72.)

A comparison was made between the average annual basin budget with the anticipated foreseeable project’s cumulative construction and operation water production

requirements. The record shows that in 2010, the CVGB balance was positive by approximately 2,608 AFY whereby inflow (approximately 13,719 AFY) to the basin is slightly greater than estimated outflows (approximately 11,111 AFY) to the basin. (Ex. 2000, p. 4.9-72.)

The storage capacity of the CVGB is approximately 15,000,000 acre feet. The amount of cumulative groundwater extraction anticipated for construction of the PSPP project and the future/foreseeable projects would have amounted to 0.01% of the total stored groundwater, which is not a significant impact. The PSPP project was expected to reduce the amount of total stored groundwater by 0.383% by the end of project operations, which was found not to be cumulatively considerable. Since the PSEGS project would use less water than PSPP, these impacts would also be less than significant. (Ex. 2000, p. 4.9-73.)

The I-10 corridor within the CVGB has been targeted for renewable energy projects that have not been identified or quantified as to quantity of water required for development. Given that perennial surface water sources are non-existent and the only available water source is groundwater, it is likely that these as yet unidentified projects could further develop the groundwater resources and exacerbate the cumulative overdraft conditions identified above. However, given the amount of total recoverable groundwater in storage (approximately 15,000,000 acre feet), the impact would be insignificant. (Ex. 2000, p. 4.9-74.)

We find that the impact related to outflow could be mitigated such that the project would not contribute to cumulative impacts. **SOIL & WATER-14** and **SOIL & WATER-17**, which impose mitigation and require monitoring of impacts to PVGB, would minimize potential impacts to the Colorado River to below a level of significance. (Ex. 2000, p. 4.9-74.)

The evidence suggests that during the life of the foreseeable projects listed, groundwater level declines between one and five feet or more would be located at a distance of approximately one to two miles from the project boundary. The closest existing well is located within two miles of the project boundary. Consequently, we assume that the potential impact to water levels in existing wells appears to be cumulatively significant, and requires monitoring and mitigation in the event that monitoring indicates significant impacts. We find that implementation of the Condition of Certification **SOIL & WATER-4** would mitigate to below significance any such impacts to groundwater users' wells due to lowering of the groundwater table. (Ex. 2000, p. 4.9-74.)

The PSEGS project would not cumulatively contribute to the possible long term operational cumulative impacts to groundwater quality given the distance to the groundwater table (less than 100 feet bgs) over the CVGB and the proposed

implementation of a hazardous material management plan, as well as monitoring plans associated with operation of surface impoundments, septic systems and other various operations. With implementation of the conditions of certification specified below, cumulative impacts to groundwater quality would be below the level of significance. (Ex. 2000, p. 4.9-76.)

Likewise, the PSEGS would not cumulatively contribute to the possible short-term cumulative impacts related to surface water hydrology because the implementation of the conditions of certification below would reduce the cumulative impacts to below the level of significance. (Ex. 2000, p. 4.9-76.)

Finally, all of the foreseeable projects would alter natural storm water drainages and the expected use of BMPs would reduce potentially significant impacts related to concentrated drainage and ensuing soil erosion and sediment transport offsite. The PSEGS would not cumulatively contribute to the possible short-term cumulative impacts related to surface water quality with implementation of the conditions of certification described below. (Ex. 2000, p. 4.9-77.)

We find that the PSEGS project, if built and operated in conformance with the existing conditions of certification, would produce no significant direct, indirect or cumulative impacts on soil and water resources.

## **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

### **Federal**

#### Clean Water Act (CWA) of 1977 (Including 1987 Amendments), Sections 401, 402 and 404

The primary objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters. Pollutants regulated under the CWA include "priority" pollutants (including various toxic pollutants), "conventional" pollutants (such as biochemical oxygen demand, total suspended solids, oil and grease, and pH), and "non-conventional" pollutants (including any pollutant not identified as either conventional or priority). (Ex. 2000, p. 4.9-79.)

## Clean Water Act Section 401

Section 401 of the CWA requires certification from the Colorado River Basin Regional Water Quality Control Board that the PSEGS project is in compliance with established water quality standards. Projects that have the potential to discharge pollutants are required to comply with established water quality objectives. These requirements include the implementation of BMPs during site grading activities and other activities associated with construction of the facility. (Ex. 2000, p. 4.9-79.)

Section 401 provides the SWRCB and the CRBRWQCB with the regulatory authority to waive, certify, or deny any proposed federally permitted activity, which could result in a discharge to waters of the state. To waive or certify an activity, these agencies must find that the proposed discharge would comply with state water quality standards. According to the CWA, water quality standards include beneficial uses, water quality objectives/criteria, and compliance with the United States Environmental Protection Agency's (USEPA) anti-degradation policy. (Ex. 2000, p. 4.9-79.)

No license or permit may be issued by a federal agency until certification required by section 401 has been granted. Under the CWA, United States Army Corp of Engineers (USACE), section 404, permits are subject to CRBRWQCB, section 401, Water Quality Certification (title 23, CCR sections 3830 through 3869). As such, a determination of "federal waters" under section 404 is required by the USACE. (Ex. 2000, p. 4.9-79.)

In August 2010, the USACE determined that "federal waters," also known as waters of the U.S., are not present on the approved PSPP project site. This jurisdictional delineation, which is valid for five years, is valid for the PSEGS because the project footprint is located within the area verified by USACE for PSPP. (For further discussion on waters of the U.S., see the **BIOLOGICAL RESOURCES** section of this FSA.) (Ex. 2000, p. 4.9-79.)

The CRBRWQCB has authority under the Porter-Cologne Water Quality Control Act of 1967, Water Code, section 13000 et seq. (Porter-Cologne), to regulate discharge of waste to waters of the state. The definition of the waters of the state is broader than that for waters of the U.S. in that all waters are considered to be a water of the state regardless of circumstances or condition. The term "discharge of waste" is also broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other "discharge" that may directly or indirectly impact waters of the state relative to implementation of section 401 of the CWA. (Ex. 2000, p. 4.9-79.)

Porter-Cologne authorizes the CRBRWQCB to regulate discharges of waste and fill material to waters of the state, including "isolated" waters and wetlands, through the issuance of waste discharge requirements (WDRs). Under Porter-Cologne, all parties proposing to discharge waste that could affect the quality of waters of the state other

than into a community sewer system shall file with the appropriate CRBRWQCB a Report of Waste Discharge (ROWD) containing such information and data as may be required by the CRBRWQCB. Condition of Certification **SOIL & WATER-6** includes updated Waste Discharge Requirements for operation of the surface impoundments, which reflects the project changes of the modified project. (Ex. 2000, p. 4.9-80.)

#### Clean Water Act Section 402

Direct and indirect discharges and storm-water discharges into waters of the U.S. must be made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit (CWA section 402). NPDES permits contain industry-specific, technology-based limits and may also include additional water-quality-based limits, and establish pollutant-monitoring requirements. An NPDES permit may also include discharge limits based on federal or state water quality criteria or standards. (Ex. 2000, p. 4.9-80.)

In 1987, the CWA was amended to include a program to address storm water discharges for industrial and construction activities. Storm-water discharge is covered by an NPDES permit, either as an individual or general permit. The CRBRWQCB administers the NPDES permit program under the CWA in the project area. The modified project would obtain a Construction General Permit to meet the section 402 NPDES requirements. (Ex. 2000, p. 4.9-80.)

#### Clean Water Act Section 404

Activities resulting in the dredging or filling of jurisdictional waters of the U.S. require authorization under a section 404 permit issued by the USACE. The USACE may grant authorization under either an individual permit or a nationwide permit (NWP) to address operations that may affect the ephemeral washes on the project site. Section 404 permits are also subject to CWA section 401 water quality certification through the CRBRWQCB. As explained above under the Clean Water Act, section 401, the USACE made a determination that there were no waters of the U.S. present on the PSPP project site. This determination, which is valid for five years, is valid for the PSEGS because the project footprint is located within the area verified by USACE for PSPP. (Ex. 2000, p. 4.9-80.)

#### **State**

The administering agencies for the state LORS are the Energy Commission, the SWRCB, and the CRBRWQCB.

#### State of California Constitution, Article X, Section 2

Article X, section 2 prohibits the waste or unreasonable use of water, regulates the method of use and method of diversion of water and requires all water users to conserve and reuse available water supplies to the maximum extent possible. The

modified project's use of dry cooling would significantly reduce potential water use and prohibit waste and unreasonable use of groundwater. (Ex. 2000, p. 4.9-81.)

#### California Storm Water Permitting Program

*California Construction Storm Water Program.* Construction activities that disturb one acre or more are required to be covered under SWRCB's NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ NPDES No. CAS 000002). (Ex. 2000, p. 4.9-81.)

Activities subject to permitting include clearing, grading, stockpiling, and excavation. The General Construction Permit requires the development and implementation of a SWPPP that specifies storm-water runoff and would also minimize erosion associated with the construction project. The SWPPP must contain site map(s) that show the construction site perimeter, existing and proposed structures and roadways, storm water collection and discharge points, general topography both before and after construction, and drainage patterns across the site. (Ex. 2000, p. 4.9-81.)

The PSEGS project would prepare a SWPPP as a requirement of the Construction General Permit. The project would also prepare a DESC to meet Energy Commission requirements. The content of a DESC is very similar to a SWPPP, but the DESC covers both construction and operation in one document, whereas separate SWPPPs are prepared for construction and operation. (Ex. 2000, p. 4.9-81.)

*California Industrial Storm Water Program.* Industrial activities with the potential to impact storm water discharges are required to obtain a NPDES permit for those discharges. In California, SWRCB's NPDES General Permit for Discharges of Storm Water Associated with Industrial Activities (Order 97-03-DWQ, NPDES No. CAS 000001) may be issued to regulate discharges associated with 10 broad categories of industrial activities, including electrical power generating facilities. The General Industrial Permit requires the implementation of management measures that would protect water quality. In addition, the discharger must develop and implement a SWPPP and a monitoring plan. Through the SWPPP, sources of pollutants are to be identified and the means to manage the sources to reduce storm water pollution described. The monitoring plan requires sampling of storm water discharges during the wet season and visual inspections during the dry season. (Ex. 2000, p. 4.9-81.)

A report documenting the status of the program and monitoring results must be submitted to the CRBRWQCB annually by July 1. The General Industrial Permit, which requires the development and implementation of a SWPPP, is required for the project's operations phase. At the present time, the facility does not have a Standard Industrial Classification (SIC) code that would require compliance with the California Industrial Storm Water Program. (Ex. 2000, p. 4.9-81.)

## California Water Code

*Section 461.* Section 461 stipulates that the primary interest of the people of the State of California is the conservation of all available water resources and requires the maximum reuse of reclaimed water as an offset to using potable resources. The modified project does not plan to use reclaimed water. However, dry cooling has been proposed and the project would minimize water usage and recycle water where appropriate. (Ex. 2000, p. 4.9-82.)

*Section 1200 "Water Rights."* All water in California falls within one of three categories: surface water; percolating groundwater; or "subterranean streams that flow through known and definite channels." California's water rights law is a hybrid system in that the use of certain types of water requires a permit from the SWRCB, while other types of uses are governed by common law. Only surface water and subterranean stream water are within the permitting jurisdiction of the SWRCB. Since 1914, appropriation of those waters has required an SWRCB permit and is subject to various permit conditions. (Ex. 2000, p. 4.9-82.)

Interstate water courses (such as the Colorado River) have additional contract requirements that are the equivalent of permits. For example, use of Colorado River water requires a contract with the Secretary of the Interior (through the USBR). (Ex. 2000, p. 4.9-82.)

Pre-1914 appropriative and riparian rights do not require a permit. Riparian rights are correlative rights of equal priority among all riparian right holders. The place of use of such water is limited to riparian property (property that is contiguous to a watercourse) that has not had its riparian rights severed. Riparian rights are senior to any appropriative rights, and may not be separated from the riparian parcel and used elsewhere. (Ex. 2000, p. 4.9-82.)

Groundwater can be (a) the underground portion of a surface water course (subject to the same rights/permits as the affiliated water course); (b) a wholly-underground water course which is treated like a water course; or (c) percolating groundwater. Water subject to appropriation is defined in Water Code section 1201 as "all water flowing in any natural channel," except water that is or may be needed for use upon riparian land or water that is otherwise appropriated. The SWRCB's authority over groundwater extends only to the underground portion of a surface stream and to the water in unappropriated subterranean streams that flow through known or defined channels, except as it is or may reasonably be needed for useful and beneficial purposes upon lands riparian to the channel through which it is flowing. The traditional test to establish SWRCB jurisdiction over groundwater was whether there is sufficient evidence of bed and banks and water flowing along a line of a surface stream (Sax 2002). (Ex. 2000, p. 4.9-82.)

Recent case law has redefined the boundaries of an underground stream to mean the bedrock bottom and side boundaries that are materially less permeable than the alluvium holding groundwater found within an alluvial valley across which flows a surface stream. If there is insufficient evidence to support a finding that the groundwater fits this definition, the SWRCB has no jurisdiction and no permit is required to appropriate the water. (Ex. 2000, p. 4.9-82.)

Percolating groundwater has no SWRCB permit requirement and supports two kinds of rights: (a) overlying rights, a correlative right of equal priority shared by all who own overlying property and use groundwater on the overlying property; and (b) groundwater appropriative rights for use of the overlying property or on overlying property for which the water rights have been severed. The right to use groundwater on property that is not as an overlying right is junior to all overlying rights, but has priority among other appropriators on a first in time use basis. Overlying users cannot take unlimited quantities of water without regard for the needs of other users. Surplus groundwater may be appropriated for use on non-overlying lands, provided such use would not create an overdraft condition. (Ex. 2000, pp. 4.9-82 – 4.9-83.)

Riparian water rights, groundwater rights, and appropriative rights are all subject to modification to some degree if there is a basin-wide adjudication, which proceeding can be commenced before the SWRCB as an adjudicative body (not a permitting role) or before a Court. In adjudication, unused riparian rights and unused overlying rights can be subordinated to appropriative rights. (Ex. 2000, p. 4.9-83.)

Water rights in California can be held by any legal entity. Thus, the owner can be an individual, related individuals, non-related individuals, trusts, corporations and/or government agencies. Water rights are considered real property. Riparian rights and overlying groundwater rights are lost if severed from the land, while appropriative rights can be preserved and transferred to other properties. Transfers of water for use elsewhere are permissible without transfers of water rights, subject to many other conditions and approvals, including a "non-injury" to another water-rights holders test, assessment of environmental impacts, and for post 1914 appropriative rights, SWRCB approval of any change in place of use, diversion point and/or purpose of use. (Ex. 2000, p. 4.9-83.)

The California Water Code allows any local public agency that provides water service whose service area includes a groundwater basin or portion thereof that is not subject to groundwater management pursuant to a judgment or other order, to adopt and implement a groundwater management plan (California Water Code sections 10750 et seq.). Groundwater Management Plans often require reports of pumping and some restrictions on usage. There is no Groundwater Management Plan for the Chuckwalla Valley Groundwater Basin (CVGB) listed on the DWR website on Groundwater Management Plans. (Ex. 2000, p. 4.9-83.)

The California Legislature has found that by reason of light rainfall, concentrated population, the conversion of land from agricultural to urban uses and heavy dependence on groundwater, the Counties of Riverside, Ventura, San Bernardino and Los Angeles have certain reporting requirements for groundwater pumping. Any person or entity that pumps in excess of 25 acre feet of water in any one year must file a "Notice of Extraction and Diversion of Water" with the SWRCB. (See Water Code, sections 4999 et seq.) The PSEGS project would be subject to this requirement since it is located in Riverside County and would require more than 25 AFY. Condition of Certification **SOIL&WATER-15** would ensure that the project owner complies with the section 1200 "Water Rights" requirement. (Ex. 2000, p. 4.9-83.)

The project is in Riverside County and the Chuckwalla Valley has no perennial streams. The project site is located on the BLM land that overlies the CVGB, which has a surface area of about 822,000 acres. A method was developed by the USGS in cooperation with the USBR to identify groundwater wells outside the flood plain of the lower Colorado River that yield water that would be replaced by water from the river. Wells placed into the groundwater beneath the project site that extract groundwater may be considered as drawing water from the Colorado River and require an entitlement to extract groundwater. The specific method to determine whether wells draw water from the Colorado River (referred to as the accounting surface) has not been promulgated by the USBR. Entitlements to extract and use the groundwater beneath the site are granted by the USBR through their designated representative in California, the Colorado River Board of California. After eligibility for groundwater extraction has been approved by the USBR, a contract must be established with the City of Needles to acquire the water. In California, the City of Needles monitors the use of water extracted from the river aquifer and is the designated contracting agent for the USBR. (Ex. 2000, p. 4.9-84.)

#### Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1967, Water Code, section 13000 et seq., requires the SWRCB and the nine RWQCBs to adopt water quality standards to protect state waters. Those standards include the identification of beneficial uses, narrative and numerical water quality criteria, and implementation procedures. Water quality standards for the proposed modified project area are contained in the Water Quality Control Plan for the Colorado River Basin Region (Basin Plan), which was adopted in 1994 and was amended in 2006. This plan sets numeric and/or narrative water quality criteria controlling the discharge of wastes to the state's waters and land. (Ex. 2000, p. 4.9-84.)

Title 23, CCR division 3, chapters 9 and 15 regards the establishment of requirements for waste discharge and reporting along with requirements specifying conditions for the protection of water quality. Under chapter 9, the CRBRWQCB is required to issue a

ROWD for discharges of waste to land pursuant to the Water Code. The report requires the submittal of information regarding the proposed discharge and waste management unit design and monitoring program. WDRs issued by the CRBRWQCB provide construction and monitoring requirements for the proposed discharge. Chapter 15 outlines siting, construction, and monitoring requirements for waste discharges to land for landfills, surface impoundments, land treatment units, and waste piles. The chapter provides closure and post-closure maintenance and monitoring requirements for Class II designated waste facilities that are applicable to this project. (Ex. 2000, p. 4.9-84.)

*Section 13050.* Surface waters (including ephemeral washes) that are affected by the project are waters of the state and are subject to state requirements and the CRBRWQCB's authority to issue WDRs for construction and industrial storm water activities. (Ex. 2000, p. 4.9-84.)

*Section 13260 et seq.* This section requires filing with CRBRWQCB a ROWD for activities in which waste is discharged that could affect the water quality of the state. The report shall describe the physical and chemical characteristics of the waste and include the results of all tests required by regulations adopted by the board, any test adopted by the California Department of Toxic Substances Control (DTSC) pursuant to section 25141 of the Health and Safety Code for extractable, persistent, and bioaccumulative toxic substances in a waste or other material, and any other tests that the SWRCB or CRBRWQCB may require. In accordance with Water Code section 13263, the (SWRCB / California Regional Water Control Board) hereby "prescribes" the waste discharge requirements as adopted by the Energy Commission for the project. Because the Energy Commission has exclusive permitting authority over the project under Public Resources Code, section 25500, the State Board "prescribes" the waste discharge requirements for the sole purpose of authorizing the Regional Board to enforce them and undertake associated monitoring, inspection, and annual fee collection as if the waste discharge requirements were adopted by the Board. (Ex. 2000, p. 4.9-85.)

*Section 13173 (Designated Wastes).* Traditionally the SWRCB along with the applicable California Regional Water Quality Control Board (hereafter "Water Boards") develop, adopt, and enforce waste discharge requirements for facilities that discharge waste. When such a facility is an electrical generating facility under the Energy Commission's jurisdiction, however, the Energy Commission permit takes the place of the Water Boards' permit and the WDRs are folded into the Energy Commission's conditions of certification. Nevertheless, Energy Commission staff believe it is important to have the Water Boards retain the authority to enforce these requirements, along with the authority to monitor, inspect, and collect an annual fee, because they are state and local agencies with expertise in this subject area. Therefore, Staff recommends that the Energy Commission delegate this authority to the Water Boards pursuant to title 20,

California Code of Regulations, section 1770(b), and has provided language to that effect in Condition of Certification **SOIL & WATER-6**. The Water Boards may also take action in tandem with delegation by the Energy Commission to prescribe the requirements adopted by the Energy Commission to ensure that their agents are fully informed and authorized to enforce the WDRs in the Commission's decision. (Ex. 2000, p. 4.9-85.)

This section defines designated waste as either a) hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to section 14142 of the Health and Safety Code, or b) non-hazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions at a waste management unit, could be released in concentrations exceeding applicable water quality objectives or could reasonably be expected to affect beneficial uses of the waters of the state contained in the appropriate state water quality control plan. (Ex. 2000, p. 4.9-85.)

*Section 13240 et seq. (Water Control Plan).* The Basin Plan for the Colorado River Basin Region establishes water quality objectives, including narrative and numerical standards that protect the beneficial uses of surface and groundwaters in the region. The Basin Plan describes implementation plans and other control measures designed to ensure compliance with statewide plans and policies and provide comprehensive water quality planning. The following chapters are applicable to determining appropriate control measures and cleanup levels to protect beneficial uses and to meet the water quality objectives: chapter 2, Beneficial Uses; chapter 3, Water Quality Objectives; and the sections of chapter 4 (Implementation) entitled “Point Source Controls” and “Non-Point Source Controls.” (Ex. 2000, pp. 4.9-85 – 4.9-86.)

- Beneficial Uses: Chapter 2 of the Basin Plan describes beneficial uses of surface and groundwaters. Beneficial uses of surface waters for the Chuckwalla Valley are not listed in the Basin Plan. The beneficial uses of groundwaters of the Chuckwalla Valley Hydrologic Unit (717.00) are: municipal and domestic supply, industrial service supply, and agricultural supply.
- Water Quality Objectives: Region-wide numeric and narrative objectives for general surface waters are described in chapter 3 of the Basin Plan under the “General Surface Water Quality Objectives” and region-wide objectives for groundwater under the “Groundwater Objectives.”
- Waste Discharge Requirements: Chapter 4 of the Basin Plan describes “Point-Source Controls” for wastewater reclamation and reuse, storm water, and septic systems. The discussion of “Non-Point Source Controls” in the Basin Plan describes the authority given to the CRBRWQCB to certify projects for CWA section 401 permits. (Ex. 2000, p. 4.9-86.)

*Section 13243.* Under this section, the California Regional Water Control Boards are granted authority to specify conditions or areas where the discharge of waste would not be permitted. The discharge of designated waste can only be discharged to an appropriately designed waste management unit. (Ex. 2000, p. 4.9-86.)

*Section 13263 (Waste Discharge Requirements).* The CRBRWQCB regulates the discharges of fill material, including structural material and/or earthen wastes into wetlands and other waters of the state through WDRs. The CRBRWQCB considers WDRs necessary to adequately address potential and planned impacts to waters of the state and to require mitigation for these impacts to comply with the water quality standards specified in the Basin Plan. Condition of Certification **SOIL & WATER-6** would ensure the PSEGS complies with this requirement. (Ex. 2000, p. 4.9-86.)

*Section 13271 (Discharge Notification).* CWC section 13271 requires any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the state, or discharge or deposited where it is, or probably would be, discharged in or on any waters of the state to notify the Office of Emergency Services (OES) of the discharge as specified in that section. The OES then immediately notifies the appropriate regional board and the local health officer and administrator of environmental health of the discharge. (Ex. 2000, p. 4.9-86.)

*Section 13550:*

The Legislature hereby finds and declares that the use of potable domestic water for non-potable uses, including, but not limited to, cemeteries, golf courses, parks, highway, landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of section 2 of article X of the California Constitution, if recycled water is available which meets all of the following conditions, as determined by the State Board.

This section requires the use of recycled water for industrial purposes subject to recycled water being available and upon a number of criteria including provisions that the quality and quantity of the recycled water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use would not impact downstream users or biological resources. (Ex. 2000, p. 4.9-86.)

The project would not be subject to this policy because it has no nearby sources of municipal recycled water. However, the project proposes to supplement its groundwater supply with recycled water produced from on-site wastewater treatment using a thermal evaporator system. (Ex. 2000, p. 4.9-87.)

*Section 13551.* This section prohibits a person or public agency, including a state agency, city, county, city and county district, or any other political subdivision of the state, from using water from any source of quality suitable for potable domestic use for

non-potable uses if suitable recycled water is available as provided in section 13550. The project would not be subject to this policy because it has no nearby sources of municipal recycled water. (Ex. 2000, p. 4.9-87.)

*Section 13552.* This section specifically identifies the use of potable domestic water for cooling towers as an unreasonable use of water within the meaning of article X, section 2, of the California Constitution, if suitable recycled water is available and the water meets the requirements set forth in section 13550. The project would not be subject to this policy because it has no nearby sources of municipal recycled water. (Ex. 2000, p. 4.9-87.)

*Section 13571.* This section requires that anyone who constructs, alters, or destroys a water well, cathodic protection well, groundwater monitoring well, or geothermal heat exchange well must file a well completion report with the California Department of Water Resources (CDWR). With no nearby sources of water available and no existing water supply wells on the project site, a water supply well and groundwater monitoring well would be constructed at the site. These wells are required as part of the evaluation of water resources for the project. A well completion report would be filed with CDWR for each well that is constructed. Measures would be undertaken to protect the groundwater wells (whether for water supply or for monitoring purposes) on the project site through the use of physical barriers (e.g., fencing, traffic bollards, etc.). In the event that an existing well is altered or destroyed, a well completion report would be filed with the CDWR. (Ex. 2000, p. 4.9-87.)

### California Code of Regulations

*Title 22, Article 3, Sections 64400.80 through 64445.* These sections require monitoring for potable water wells, defined as non-transient, non-community water systems (serving 25 people or more for more than six months). The project would be subject to this requirement because it would employ approximately 100 workers during operations. Regulated wells must be sampled for bacteriological quality once a month and the results submitted to the California Department of Public Health (CDPH). The wells must also be monitored for inorganic chemicals once and organic chemicals quarterly during the year designated by the CDPH. CDPH would designate the year based on historical monitoring frequency and laboratory capacity. Condition of Certification **SOIL & WATER-15** would ensure the project owner complies with requirements of non-transient, non-community water systems. (Ex. 2000, p. 4.9-87.)

*Title 23, Division 3, Chapter 9.* This chapter requires the CRBRWQCB to issue a report of waste discharge for discharges of waste to land pursuant to the California Water Code. The report requires submittal of information regarding the proposed discharge and waste management unit design and monitoring program. WDRs issued by the CRBRWQCB provide construction and monitoring requirements for the proposed

discharge. The SWRCB has adopted general waste discharge requirements (97-10-DWQ) for discharge to land by small domestic wastewater treatment systems. Condition of Certification **SOIL & WATER-6** would meet the requirements of a report of waste discharge for discharges of waste to land and obtain waste discharge requirements. (Ex. 2000, p. 4.9-88.)

With respect to on-site wastewater discharge, the CRBRWQCB adopted in 1984 “Guidelines for Sewage Disposal from Land Developments” that provide exclusion of on-site sanitary wastewater flows less than 5,000 gallons per day. Based on the estimate of approximately 3,010 gallons per day of sanitary wastewater spread out among three or more locations, the exclusion applies. Condition of Certification **SOIL & WATER-7** would ensure the sanitary wastewater disposal systems meet County of Riverside requirements. (Ex. 2000, p. 4.9-88.)

*Title 23, Division 3, Chapter 15.* This chapter regulates all discharges of hazardous waste to land that may affect water quality. Chapter 15 broadly defines a waste management area as “an area of land, or a portion of a waste management facility, at which waste is discharged.” Therefore, unless exempted, all discharges of hazardous waste to land that may affect water quality are regulated by chapter 15. This chapter outlines siting, construction and monitoring requirements for waste discharges to land for landfills, surface impoundments, land treatment units, and waste piles. The chapter provides closure and post-closure maintenance and monitoring requirements for surface impoundments that are applicable to the project. (Ex. 2000, p. 4.9-88.)

#### State Water Resources Control Board Policies

*Anti-Degradation Policy (Resolution No. 68-16).* This policy requires the CRBRWQCB, in regulating the discharge of waste to: (a) maintain existing high quality waters of the state until it is demonstrated that any change in quality would be consistent with maximum benefit to the people of the state, would not unreasonably affect present and anticipated beneficial uses, and would not result in water quality less than that described in state or regional water board policies; and (b) require that any activity that produces or may produce a waste or increased volume or concentration of waste and that discharges or proposes to discharge to existing high quality waters, must meet waste discharge requirements, which would result in the best practicable treatment or control of the discharge necessary to assure that a) a pollution or nuisance would not occur, and b) the highest water quality consistent with maximum benefit to the people of the state would be maintained. Conditions of Certification **SOIL & WATER-1, -6, -7, -18,** and **-20** would protect the quality of groundwater and surface water. (Ex. 2000, p. 4.9-88.)

*Power Plant Cooling Water Policy (Resolution No. 75-58).* On June 19, 1975, the SWRCB adopted the Water Quality Control Policy on the use and disposal of inland

waters used for power plant cooling. The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for power plants that depend on inland waters for cooling. State policy encourages the use of wastewater for power plant cooling and sets the following order of preference for cooling purposes: 1) wastewater being discharged to the ocean; 2) ocean water; 3) brackish water or irrigation return flows; 4) inland waste waters of low total dissolved solids (TDS); and 5) other inland waters. The criteria for the selection of water delivery options involves: economic feasibility; engineering constraints such as cooling water composition and temperature; and environmental considerations such as impacts on riparian habitat, groundwater levels, and surface and subsurface water quality. (Ex. 2000, p. 4.9-89.)

The project would use dry-cooling methods and does not propose to use groundwater for power plant cooling. The project would use groundwater for mirror washing, auxiliary equipment cooling, process makeup, dust suppression, and potable supply. (Ex. 2000, p. 4.9-89.)

*Water Reclamation Policy (Resolution No. 77-01).* Under this policy, the SWRCB and CRBRWQCB shall encourage reclamation and reuse of water in water-short areas. Reclaimed water would replace or supplement the use of fresh water or better quality water. The project would not be subject to this policy because it has no nearby sources of municipal recycled water. However, the project proposes to supplement its groundwater supply with recycled water produced from on-site wastewater treatment using a thermal evaporator system. (Ex. 2000, p. 4.9-89.)

*Policies and Procedures for Investigations and Clean-up and Abatement of Discharges Under CWC, Section 13304 (Resolution No. 92-49).* This policy establishes requirements for investigation and cleanup and abatement of discharges. Under this policy, clean-up and abatement actions are to implement applicable provisions of title 23 CCR chapter 15, to the extent feasible. The policy also requires the application of section 2550.4 of chapter 15 when approving any alternative cleanup levels less stringent than background. It requires remediation of the groundwater to the lowest concentration levels of constituents technically and economically feasible, which must at least protect the beneficial uses of groundwater, but need not be more stringent than is necessary to achieve background levels of the constituents in groundwater. The project is not likely to be subject to this requirement because a Phase 1 Environmental Site Assessment conducted in 2009 concluded that no recognized environmental conditions (such as contaminated soil) were associated with the project site. (Ex. 2000, p. 4.9-89.)

*Water Quality Control Policy for Recycled Water (Resolution No. 209-0011).* The Recycled Water Policy is intended to promote sustainable local water supplies. The purpose of this policy is to increase the use of recycled water from municipal wastewater sources that meet the definition in CWC section 13050(n), in a manner that

implements state and federal water quality laws. The project would not be subject to this policy because it has no nearby sources of municipal recycled water. However, the project proposes to supplement its groundwater supply with recycled water produced from on-site wastewater treatment using a thermal evaporator system. (Ex. 2000, p. 4.9-89.)

### Public Resources Code

*Section 25300 et seq.* In the 2003 “Integrated Energy Policy Report,” consistent with SWRCB Policy No. 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they would approve the use of “fresh inland” water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound.” The project does not propose to use groundwater for power plant cooling. The project would use dry-cooling methods and does not propose to use groundwater for power plant cooling. The project would use groundwater for mirror washing, auxiliary equipment cooling, process makeup, dust suppression, and potable supply. (Ex. 2000, p. 4.9-90.)

### Project Compliance with State Water Policy

The Energy Commission has five authoritative sources for statements of policy relating to water use in California applicable to power plants. They are the California Constitution, the Warren-Alquist Act, the Commission’s restatement of the state’s water policy in the 2003 Integrated Energy Policy Report (“IEPR”), the SWRCB resolutions (in particular resolutions 75-58 and 88-63), and a letter from the SWRCB to the Energy Commission interpreting resolutions 75-58 and 88-63 (collectively referred to as the state’s water policies - see Genesis Solar project (09-AFC-08)). (Ex. 2000, p. 4.9-90.)

### California Constitution

California’s interest in conserving water is so important to our thirsty state that in 1928 the common law doctrine of reasonable use became part of the state Constitution. article X, section 2 calls for water to be put to beneficial use, and that “waste or unreasonable use or unreasonable *method of use* be prevented.” (Cal. Const., art. X, § 2; emphasis added.) The article also limits water rights to reasonable use, including reasonable methods of use. (*Ibid.*) Even earlier in the 20th Century, a state Supreme Court case firmly established that groundwater is subject to reasonable use. (*Katz v. Walkinshaw* (1903) 141 Cal. 116.) Thus, as modern technology has made dry cooling of power plants feasible, the Commission may regard wet cooling as an unreasonable method of use of surface or groundwater, and even as a wasteful use of the state’s most precious resource. (Ex. 2000, p. 4.9-90.)

### Warren-Alquist Act

Section 25008 of the Commission's enabling statutes echoes the constitutional concern by promoting "all feasible means" of water conservation and "all feasible uses" of alternative water supply sources. (Pub. Resources Code, § 25008.) (Ex. 2000, p. 4.9-90.)

### Integrated Energy Policy Report

In the 2003 IEPR, the Commission reiterated certain principles from SWRCB's Resolution 75-58, discussed below, and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission's jurisdiction. The report states that the Commission would approve the use of fresh water for cooling purposes only where alternative water supply sources or alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." (IEPR (2003), p. 41.) In the report, the Commission interpreted "environmentally undesirable" as equivalent to a "significant adverse environmental impact" under CEQA, and "economically unsound" as meaning "economically or otherwise infeasible," also under CEQA. (IEPR, p. 41.) CEQA and the Commission's siting regulations define feasible as "capable of being accomplished in a successful manner within a reasonable amount of time," taking into account economic and other factors. (Cal. Code Regs., tit. 14, §15364; tit. 20, §1702, subd. (f).) At the time of publication in 2003, dry cooling was already feasible for three projects—two in operation and one just permitted. (IEPR, p. 39.) (Ex. 2000, pp. 4.9-90 – 4.9-91.)

The report also notes California's exploding population is estimated to reach more than 47 million by 2020 and is a population that would continue to use "increasing quantities of fresh water at rates that cannot be sustained." (IEPR, p. 39.) (Ex. 2000, p. 4.9-91.)

### State Water Resources Control Board Resolutions

The SWRCB not only considers quantity of water in its resolutions, but also the quality of water. In 1975, the Board determined that water with total dissolved solids ("TDS") of 1,000 mg/l or less should be considered fresh water. (Resolution 75-58.) One express purpose of that Resolution was to "keep the consumptive use of fresh water for power plant cooling to that *minimally essential*" for the welfare of the state. (*Ibid*, emphasis added.) In 1988, the Board determined that water with TDS of 3,000 mg/l or less should be protected for and considered as water for municipal or domestic use. (Resolution 88-63.) (Ex. 2000, p. 4.9-91.)

The project proposes a dry-cooled facility that would use 201 AFY of groundwater from on-site wells. Groundwater is the only available source of water. Pumped water would be used for various purposes, including domestic use by workers, dust suppression, and mirror washing. Water is the only feasible means of cleaning the mirrors, which

must be clean to maintain efficiency of output by solar plants. Process makeup water would be recycled to supplement groundwater supplies. Overall use of the water is efficient for this technology, requiring about 40 AFY per 100 MW of capacity. (Ex. 2000, p. 4.9-91.)

Quality of the groundwater varies significantly throughout the CVGB, and varies with depth. In general, groundwater below the project site would not meet water quality standards for domestic supply without treatment because of high concentrations of fluoride and sulfate. Staff concludes that the modified PSEGS project complies with the state's water policies to feasibly use the least amount of the lowest-quality water available. (Ex. 2000, p. 4.9-91.)

## **Regional and Local**

### Riverside County Ordinance Codes, Title 13, Chapter 13.20 – Water Wells

*Section 13-.20.160 Well Logs.* This section requires that a report of well excavation for all wells dug or bored for which a permit has been issued be submitted to the Riverside County Department of Environmental Health within 60 days after completion of drilling. (Ex. 2000, p. 4.9-91.)

*Section 13.20.190 Water Quality Standards.* This section requires that water from wells that provide water for beneficial use shall be tested radiologically, bacteriologically and chemically as indicated by the Riverside County Department of Environmental Health. Laboratory testing must be performed by a State of California certified laboratory. The results of the testing shall be provided to the County Department of Environmental Health within 90 days of pump installation. (Ex. 2000, p. 4.9-92.)

*Section 13.20.220 Well Abandonment.* This section provides that all abandoned wells shall be destroyed in such a way that they would not produce water or act as a channel for the interchange of water, and would not present a hazard to the safety and well-being of people or animals. Destruction of any well shall follow requirements stipulated in DWR Bulletin No.74-81, provided that at a minimum the top 50 feet shall be sealed with concrete, or other approved sealing material. Applications for well destruction must be submitted 90 days following abandonment of the well and in accordance with section 14.08.170. (Ex. 2000, p. 4.9-92.)

*Section 13.20.240 Declaration of Proposed Reuse.* Requires that any well that has not been used for a period of one year shall be properly destroyed unless the owner has filled a "Notice of Intent" with the health officer declaring the well out of service and declaring his intention to use the well again. (Ex. 2000, p. 4.9-92.)

Condition of Certification **SOIL & WATER-15** would ensure the project owner complies with requirements to construct and operate groundwater wells. (Ex. 2000, p. 4.9-92.)

Riverside County Ordinance Code, Title 8, Chapter 8.124 – Sewage Discharge

*Section 8.124.030, General Requirements for an Approval and Construction Permit.* The type, capacity, location, and layout of each private system shall comply with the rules and regulations of the health officer, and the WDRs of the CRBRWQCB. A private system shall be constructed and maintained on the lot that is the site of the building it serves, unless the health officer in his discretion authorizes a different location. (Ex. 2000, p. 4.9-92.)

*Section 8.124.050 Operation Permits.* Each private system shall be managed, cleaned, regulated, repaired, modified and replaced from time to time by the owner or owner's representatives, in accordance with the rules, regulations and other reasonable requirements of the health officer in conformity with the WDR issued by the regional Board and in a manner which would safeguard against and prevent pollution, contamination or nuisance. (Ex. 2000, p. 4.9-92.)

Condition of Certification **SOIL & WATER-7** would ensure the sanitary wastewater disposal systems meet County of Riverside requirements. (Ex. 2000, p. 4.9-92.)

Riverside County Ordinance Code, Title 15, Chapter 15.24 - Uniform Plumbing Code

*Section 15.24.010. Adopted by Reference, Appendix K, Section K1 amended – Private Sewage Disposal – General.* In certain areas of the county which have poor soils or other problems relative to sewage disposal, the sewage disposal system shall be installed and inspected before the building foundation inspection is made. (Ex. 2000, p. 4.9-92.)

*Section 15.24.010. Adopted by Reference, Appendix K, Section K6(i) amended – Disposal Fields.* Disposal fields, trenches, and leaching beds shall not be paved over or covered by concrete or any material that can reduce or inhibit any possible evaporation of the sewer effluent unless the area of the disposal fields, trenches, and leaching beds is increased by a minimum of 25 percent. (Ex. 2000, p. 4.9-93.)

Condition of Certification **SOIL & WATER-7** would ensure the sanitary wastewater disposal systems meet County of Riverside requirements. (Ex. 2000, p. 4.9-93.)

Riverside County Ordinance Code, Title 15, Chapter 15.80 - Regulating Flood Hazard Areas and Implementing the National Flood Insurance Program

This ordinance was developed to comply with title 44 CFR, part 65, regarding requirements for the identification and mapping of areas identified as Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas. The ordinance is applicable to development within unincorporated areas of Riverside County and is integrated into the process of application for development permits under other County ordinances including, but not limited to, Ordinance Nos. 348, 369, 457, 460, and 555. When the information required or procedures involved in the processing of such

applications is not sufficient to assure compliance with the requirements of chapter 15.80, a separate application must be filed. (Ex. 2000, p. 4.9-93.)

Flood insurance rate maps for the project site or surrounding areas have not been prepared by FEMA. According to the Riverside County General Plan (Riverside County 2000) the project site and surrounding lands do not lie within a 100-year or 500-year flood plain. Therefore, the project would not be subject to these requirements. (Ex. 2000, p. 4.9-93.)

We find that the PSEGS project would comply with all of the above LORS.

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project would be beneficial to the public, Petitioner, or intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D)).

### **BENEFITS**

The PSEGS project reduces construction water consumption by approximately 80 percent, from 5,750 acre feet to 1,130 acre feet over 33 months. Operational water use would decrease by one-third, from 300 AFY to 201 AFY. The PSEGS project would not require Land Treatment Units and would preserve natural drainage patterns for the majority of the site instead of eliminating all on-site natural drainage as required in the PSPP. PSEGS would construct diversion channels to bypass storm water runoff only around power blocks and common facilities areas instead of the three large drainage control channels to redirect all off-site storm water runoff around the solar fields as originally designed for the PSPP. The PSEGS project would eliminate the secondary emergency access road, reduce the project footprint from 4,366 acres to 3,794 acres, and reduce the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface. (Ex. 2000, p. 4.9-6).

### **PUBLIC COMMENT**

The following comments received from the public regarding the soil and water resources:

On October 24, 2013, the **Colorado River Board** submitted written comments describing that because the Chuckwalla Valley Groundwater Basin is hydrologically

connected to the Colorado River, it is part of the Colorado River “accounting surface.”. At present, all water from the Colorado River is previously committed to other shareholders so that PSEGS would need to find a legal source for water other than as outlined. In addition, the Colorado River Board requested that it be included in the review and comment on any proposed Water Offset Plan that is submitted in connection with Condition of Certification **SOIL & WATER-14** and/or **17**. The Water Offset Plan must demonstrate the project owner’s legal right to utilize Colorado River water. Verification will be essential to determine whether the project owner has complied with the obligations in the Boulder Canyon Project Act and the Consolidated Decree. The Board also requests that the Bureau of Land Management should remove the sentence “No effect on flows in the Colorado River is anticipated” as shown in Table ES-1, on p. ES-7 of the Executive Summary in the BLM’s PSEGS PA/DSEIS when it publishes a Final Plan Amendment and Supplemental EIS.

The **Metropolitan Water District of Southern California (Metropolitan)** submitted comments on water on November 5, 2013. Metropolitan is concerned that the alternatives identified in the proposed Condition of Certification **SOIL & WATER-14** will not be effective in offsetting impacts to lower Colorado River water supplies and/or are not viable. Thus, Metropolitan is requesting that CEC replace proposed Condition of Certification **SOIL & WATER-14** with a mitigation measure that the BLM included in a similar project, the Desert Harvest Solar project, which identifies viable mitigation alternatives. A copy of a proposed mitigation measure, MM WAT-7, was enclosed for reference. Metropolitan also requested that the CEC substitute the Colorado River accounting surface elevation for the Palen Solar Electric Generating System shown on Figure 6 of the U.S. Geological Survey's Scientific Investigations Report 2008-5113, "Update of the Accounting Surface Along the Colorado River," for the value shown in MM WAT-7 for the Desert Harvest Solar project. Finally, Metropolitan pointed out that entities in California are already using California's full apportionment of Colorado River water, meaning that all water is already contracted and no new water entitlements are available in California during shortage, normal, and intentionally created surplus conditions. Thus, to offset groundwater that would be replaced by Colorado River water, the project proponent will have to obtain water from the existing junior priority holder, Metropolitan, which has the authority to sell water for power plant use. Metropolitan is willing to discuss the exchange of a portion of its water supplies with the project proponent, subject to any required approvals by Metropolitan's Board of Directors.

Except for those concerns, issues or questions regarding the content or analysis conducted by the Bureau of Land Management in the parallel process for approvals necessary for the PSEGS, all other concerns are addressed above in the **SOIL AND WATER RESOURCES** section of this Decision. Since the PSEGS project uses a reduced amount of water during construction with the same proposed groundwater

supply system as the approved PSPP project, we again find PSEGS project's impacts are fully mitigated.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The PSEGS project reduces the project footprint from 4,366 acres to 3,794 acres, a difference of 572 acres.
2. The total earthwork proposed by the PSEGS project is 213,000 cubic yards, which is roughly five percent of the PSPP's 4,500,000 cubic yards of total earthwork.
3. Project soil losses due to construction and grading activities would expose and disturb the soil and leave soil particles vulnerable to detachment by wind and water.
4. With the implementation of conditions of certification, BMPs and associated monitoring activities included in the approved DESCP and SWPPP, impacts on soil would be less than significant during construction of the amended PSEGS project.
5. Areas disturbed during the construction phase are subject to potential erosion during the 25 to 30 years of operational life of the project.
6. Compliance with an approved DESCP in accordance with Condition of Certification **SOIL & WATER-1** and an approved Storm Water Monitoring and Response Plan in accordance with Condition of Certification **SOIL & WATER-20** would reduce the impacts of off-site soil erosion during operation of the PSEGS project to below the level of significance.
7. For purposes of an amendment, the PSEGS project's reduced consumption of water during both construction and operation using the same proposed groundwater supply system as the approved PSPP project does not constitute a project change from the approved project.
8. Conditions of Certification **SOIL & WATER-14** and **SOIL & WATER-17** as approved in the PSPP Decision also apply to the amended PSEGS project.
9. Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-5** minimize impacts to groundwater levels below the level of significance.
10. Conditions of Certification **SOIL & WATER-2** through **SOIL & WATER-7**, **SOIL & WATER-16** and **SOIL & WATER-18** as approved in the PSPP Decision would also mitigate the PSEGS project's impacts to groundwater levels to a level of insignificance.

11. Conditions of Certification **SOIL & WATER-1**, **SOIL & WATER-6**, and **SOIL & WATER-20** reduce the potential storm damage caused by water leaving the site, which reduces the potential for impacts to surface water hydrology to less than significant.
12. Due to the distance to the groundwater table (180 feet below ground), the elimination of land treatment units and the proposed implementation of a hazardous material management plan during construction, potential impacts to groundwater quality are below the level of significance.
13. Operation of the septic systems and leach fields from these areas would not impact groundwater quality at the nearest offsite wells.
14. The Implementation of Conditions of Certification **SOIL & WATER-1** DESCP and **SOIL&WATER-20** (Storm Water Damage Monitoring and Response Plan) would minimize impacts related to flood hazards and erosion associated with construction and operation of the PSEGS project to below the level of significance.
15. Implementation of BMPs as defined in Conditions of Certification **SOIL & WATER-1**, **-6**, and **-20** and Conditions of Certification **HAZ-1** and **HAZ-2** reduce potential surface water quality impacts during construction and operations to insignificance.
16. PSEGS impacts to groundwater levels and water quality in the CVGB and the PVGB are not cumulatively considerable and would have no significant cumulative impact on the Colorado River, neighboring wells, surface water quality, or hydrology.
17. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. Implementation of the conditions of certification listed below ensures that the PSEGS would not result in any significant direct, indirect, or cumulative adverse impacts to soil and water resources.
2. With implementation of the conditions of certification below, the PSEGS project would comply with all applicable LORS related to soil and water resources as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.
3. The change in the project would be beneficial to the public, Applicant, and intervenors because the PSEGS project reduces construction water consumption

by approximately 80 percent, from 5,750 acre feet to 1,130 acre feet over 33 months. Operational water use would decrease by one-third, from 300 AFY to 201 AFY. The PSEGS project would not require Land Treatment Units and would preserve natural drainage patterns for the majority of the site, instead of eliminating all on-site natural drainage as required in the PSPP. PSEGS would construct diversion channels to bypass storm-water runoff only around power blocks and common facilities areas instead of the three large drainage control channels to redirect all off-site storm-water runoff around the solar fields as originally designed for the PSPP. The PSEGS project would eliminate the secondary emergency access road; reduce the project footprint from 4,366 acres to 3,794 acres; and reduce the amount of grading by 4.3 million cubic yards because the heliostat technology does not require an entirely flat surface.

4. There has been a substantial change in circumstances since the original approval because at the time of the original licensing the project was wholly-owned by Solar Millenium. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

### **DRAINAGE EROSION AND SEDIMENTATION CONTROL PLAN (DESCP)**

**SOIL & WATER-1** Prior to site mobilization, the project owner shall obtain the Compliance Project Manager (CPM) approval of the DESCPC for managing storm water during project construction and operations as normally administered by the County of Riverside. The DESCPC must ensure proper protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, include provisions for sediment and storm water retention from both the power block, solar fields and transmission right-of-way to meet any Riverside County requirements, address exposed soil treatments in the solar fields for both road and non-road surfaces, and identify all monitoring and maintenance activities. The plan must also cover all linear project features such as off-site transmission mains. The DESCPC shall contain, at minimum, the elements presented below that outline site management activities and erosion and sediment-control BMP to be implemented during site mobilization, excavation, construction, and post construction (operating) activities.

**A. Vicinity Map** – A map(s), at a minimum scale of 1 inch to 500 feet, shall be provided indicating the location of all project elements (construction sites, lay-down area, pipelines) with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

**B. Site Delineation** – All areas subject to soil disturbance for the proposed project (project phases, lay-down area, all linear facilities, landscaping areas, and any other project elements) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

**C. Watercourses and Critical Areas** – The DESCPC shall show the location of all nearby watercourses including swales, storm drains, and desert washes. It shall indicate the proximity of those features to the proposed project construction, lay-down, and landscape areas and all transmission and pipeline construction corridors.

1. The DESCPC shall describe how the project would avoid or minimize impacts to the Palen-McCoy Valley sand corridor,

2. All proposed linear features (with the exception of power pylons) shall be constructed flush with the surrounding ground surface and without ground level obstructions.

3. Earthwork and temporary construction-related activities shall be conducted such that off-site resources are protected from impacts due to redirection of flood flows around and through the site. Construction activities shall proceed in a manner so as to minimize exposure of facilities to construction period flooding. Temporary diversion channels, if employed, shall be adequately designed for flood conveyance capable of protecting the construction site while not contributing to on-site or off-site erosion.

**D. Drainage Map** – The DESCPC shall provide a topographic site map(s), at a minimum scale of 1 inch to 200 feet, showing existing, interim, and proposed drainage swales and drainage systems and drainage-area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet.

**E. Drainage of Project Site Narrative** – The DESCPC shall include a narrative of the drainage measures necessary to protect the site and potentially affected soil and water resources within the drainage downstream of the site. The narrative shall include the summary pages from the hydraulic analysis prepared by a professional engineer and erosion control specialist. The narrative shall state the watershed size(s) in acres that was used in the calculation of drainage features.

**F. Clearing and Grading Plans** – The DESCPC shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography shall be illustrated by tying in proposed contours with existing topography.

**G. Clearing and Grading Narrative** – The DESCPC shall include a table with the estimated quantities of material excavated or filled for the site and all project elements (project site, lay-down area, transmission and pipeline corridors, roadways, and bridges), whether such excavation or fill is temporary or permanent, and the amount of such material to be imported or exported.

**H. Soil Wind and Water Erosion Control** – The plan shall address exposed soil treatments to be used during construction and operation of the proposed project for both road and non-road surfaces including specifically identifying all chemical based dust palliatives, soil bonding, and weighting agents appropriate for use at the proposed project site that would not cause adverse effects to vegetation. BMPs shall include measures designed to prevent wind and water erosion including application of chemical dust palliatives after rough grading to limit water use. All dust palliatives, soil binders, and weighting agents shall be approved by the CPM prior to use.

**I. Best Management Practices Plan** – The DESCPC shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). BMPs shall include measures designed to control dust, stabilize construction access roads and entrances, and control storm water runoff and sediment transport.

**J. Best Management Practices Narrative** – The DESCPC shall show the location (as identified in (I) above), timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during all project element (site, pipelines) excavations and construction, final grading/stabilization, and operation. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule shall include post-construction maintenance of structural-control BMPs, or a statement provided about when such information would be available.

**K. Project Schedule** – The DESCP shall identify on the topographic site map the location of the site-specific BMPs to be employed during each phase of construction (initial grading, project element construction, and final grading/stabilization). Separate BMP implementation schedules shall be provided for each project element for each phase of construction.

**L. Erosion Control Drawings** – The erosion-control drawings and narrative shall be designed, stamped and sealed by a professional engineer or erosion control specialist.

**M. Agency Comments** – The DESCP shall include copies of recommendations, conditions, and provisions from the County of Riverside, California Department of Fish and Game (CDFG), and Colorado River Basin Regional Water Quality Control Board (CRBRWQCB).

**N. Monitoring Plan** – Monitoring activities shall include routine measurement of the volume of accumulated sediment in the on-site drainage ditches, and storm-water diversions.

**VERIFICATION:** No later than 30 days prior to start of site mobilization, the project owner shall submit a copy of the final DESCP to the County of Riverside, the CRBRWQCB, and the CPM for review and comment. The CPM shall consider comments if received by the County and CRBRWQCB before approval of the DESCP.

The DESCP shall be consistent with the grading and drainage plan and relevant portions of the DESCP shall clearly show approval by the chief building official. The DESCP shall be a separate plan from the SWPPP developed in conjunction with any National Pollutant Discharge Elimination System (NPDES) permit for construction activity. The project owner shall provide in the monthly compliance report with a narrative on the effectiveness of the drainage, erosion, and sediment-control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall update and maintain the DESCP for the life of the project and shall provide in the annual compliance report information on the results of monitoring and maintenance activities.

## **PROJECT GROUNDWATER WELLS, PRE-WELL INSTALLATION**

**SOIL & WATER-2** The project owner proposes to construct and operate on-site groundwater supply wells that produce water from the CVGB. The project owner shall ensure that the wells are completed in accordance with all applicable state and local water well construction permits and requirements. Prior to initiation of well construction activities, the project owner shall submit for review and comment a well construction packet to the County of Riverside and fees normally required for the County's well

permit, with copies to the CPM. The project shall not construct a well or extract and use groundwater until approval has been issued by the County and the CPM to construct and operate the well. Wells permitted and installed as part of pre-construction field investigations that subsequently are planned for use as project water supply wells require CPM approval prior to their use to supply water to the project.

**Post-Well Installation.** The project owner shall provide documentation as required under county permit conditions to the CPM that the well has been properly completed. In accordance with California Water Code section 13754, the driller of the well shall submit to the DWR a Well Completion Report for each well installed. The project owner shall ensure the Well Completion Reports are submitted. The project owner shall ensure compliance with all county water well standards and the county requirements for the life of the wells, and shall provide the CPM with two copies each of all monitoring or other reports required for compliance with the County of Riverside water well standards and operation requirements, as well as any changes made to the operation of the well.

**VERIFICATION:** The project owner shall do all of the following:

- a. No later than 60 days prior to the construction of the on-site groundwater production wells, the project owner shall submit to the CPM a copy of the water well construction packet submitted to the County of Riverside.
- b. No later than 30 days prior to the construction of the on-site groundwater production wells, the project owner shall submit a copy of written concurrence received from the County of Riverside that the proposed well construction activities comply with all county well requirements and meet the requirements established by the County's water well permit program. The CPM shall provide approval to the project owner of the well location and operation within 10 days of receipt of the County of Riverside's concurrence with the proposed well construction activities.
- c. No later than 60 days after installation of each well at the project site, the project owner shall ensure that the well driller submits a Well Completion Report to the DWR with a copy provided to the CPM. The project owner shall submit to the CPM together with the Well Completion Report a copy of well drilling logs, water quality analyses, and any inspection reports. Additionally no later than 60 days after installation of each well (including closure of any associated mud pits) the project owner shall submit documentation to the CPM and the CRBWQCB that well drilling activities were conducted in compliance with California Code of Regulations, title 23, chapter 15, Discharges of Hazardous Wastes to Land (Cal. Code Regs., tit. 23, §§

2510 et seq.) and that any on-site drilling sumps used for project drilling activities were removed in compliance with California Code of Regulations, title 23, section 2511(c).

- d. During well construction and for the operational life of the well, the project owner shall submit 2 copies each to the CPM of any proposed well construction or operation changes.

## **CONSTRUCTION AND OPERATION WATER USE**

**SOIL & WATER-3** The proposed project's use of ground water during construction shall not exceed 204 AFY (total of 578 acre feet over the entire construction period). The project's use of groundwater during operation shall not exceed 101 AFY during operation. Water quality used for project construction and operation shall be reported in accordance with Condition of Certification **SOIL & WATER-18** to ensure compliance with this condition.

**VERIFICATION:** Prior to the use of groundwater for construction, the project owner shall install and maintain metering devices as part of the water supply and distribution system to document project water use and to monitor and record in gallons per day the total volume(s) of water supplied to the project from this water source. The metering devices shall be operational for the life of the project.

At least 60 days prior to the start of construction of the proposed project, the project owner shall submit to the CPM a copy of evidence that metering devices have been installed and are operational.

Beginning six months after the start of construction, the project owner shall prepare a semi-annual summary of amount of water used for construction purposes. The summary shall include the monthly range and monthly average of daily water usage in gallons per day.

The project owner shall prepare an annual summary, which shall include daily usage, monthly range and monthly average of daily water usage in gallons per day, and total water used on a monthly and annual basis in acre-feet. For years subsequent to the initial year of operation, the annual summary shall also include the yearly range and yearly average water use by source. For calculating the total water use, the term "year" shall correspond to the twelve month period after the date established for the annual compliance report submittal.

## GROUNDWATER LEVEL MONITORING, MITIGATION, AND REPORTING

**SOIL & WATER-4** The project owner shall submit a Groundwater Level Monitoring, Mitigation, and Reporting Plan to the CPM for review and approval in advance of construction activities and prior to the operation of on-site groundwater supply wells. The Groundwater Level Monitoring, Mitigation, and Reporting Plan shall provide detailed methodology for monitoring background and site groundwater levels. Monitoring shall include pre-construction, construction, and project operation water use. The plan shall establish pre-construction and project related groundwater level and water quality trends that can be quantitatively compared against observed and simulated trends near the project pumping wells and near potentially impacted existing wells.

### A. Prior to Project Construction

1. A well reconnaissance shall be conducted to investigate and document the condition of existing water supply wells located within three miles of the project site, provided that access is granted by the well owners. The reconnaissance shall include sending notices by registered mail to all property owners within a three mile radius of the project area.
2. Monitor to establish preconstruction conditions. The monitoring plan and network of monitoring wells shall make use of existing wells in the basin that would satisfy the requirements for the monitoring program. The monitoring network shall be defined by the groundwater model developed for the AFC as the area predicted to show a water level change of one foot or more at the end of construction and at the end of operation and any monitoring wells that are installed to comply with Waste Discharge Requirements issued by the Energy Commission for the evaporation ponds and land treatment unit associated with the project. The projected area of groundwater draw-down shall be refined on an annual basis during project construction and every three years during project operations using the data acquired as part of Condition of Certification **SOIL & WATER-4**, as well as the numerical groundwater model developed as part of the AFC and subsequent Data Responses by the applicant. If the area predicted to show a water level change of one foot increases, the project owner would be required to submit a revised monitoring plan with additional monitoring wells (if required).
3. Identified additional wells shall be located outside of this area to serve as background monitoring wells. Abandoned wells or wells no longer in

use that are accessible and provide reliable water level data within the potentially impacted area shall also be included as part of the monitoring network. A site reconnaissance shall be performed to identify wells that could be accessible for monitoring. As access to these wells is available, historic water level, water quality, well construction and well performance information shall be obtained for both pumping and non-pumping conditions.

4. As access allows, measure groundwater levels from the off-site and on-site wells within the network and back-ground wells to provide initial groundwater levels for pre-project trend analysis.
5. Construct water level maps within the CVGB within five miles of the site from the groundwater data collected prior to construction. Update trend plots and statistical analyses, as data is available.

B. During Construction:

1. Collect water levels from wells within the monitoring network and flows from seeps and or springs on a quarterly basis throughout the construction period and at the end of the construction period. Perform statistical trend analysis for water levels. Assess the significance of an apparent trend and estimate the magnitude of that trend.

C. During Operation:

1. On a quarterly basis for the first year of operation and semi-annually thereafter for the following four years, collect water level measurements from any wells identified in the groundwater monitoring program to evaluate operational influence from the project. Quarterly operational parameters (i.e., pumping rate) of the water supply wells shall be monitored. Additionally, quarterly groundwater use in the CVGB shall be estimated based on available data.
2. On an annual basis, perform statistical trend analysis for water levels data and comparison to predicted water level declines due to project pumping. Analysis of the significance of an apparent trend shall be determined and the magnitude of that trend estimated. Based on the results of the statistical trend analyses and comparison to predicted water level declines due to project pumping, the project owner shall determine the area where the project pumping has induced a draw-down in the water supply at a level of five feet or more below the baseline trend.

3. If water levels have been lowered more than five feet below pre-site operational trends, and monitoring data provided by the project owner show these water level changes are different from background trends and are caused by project pumping, then the project owner shall provide mitigation to the impacted well owner(s). Mitigation shall be provided to the impacted well owners that experience five feet or more of project-induced draw-down if the CPM's inspection of the well monitoring data confirms changes to water levels and water level trends relative to measured pre-project water levels, and the well (private owner's well in question) yield or performance has been significantly affected by project pumping. The type and extent of mitigation shall be determined by the amount of water level decline induced by the project, the type of impact, and site-specific well construction and water use characteristics. If an impact is determined to be caused by draw-down from more than one source, the level of mitigation provided shall be proportional to the amount of draw-down induced by the project relative to other sources. In order to be eligible, a well owner must provide documentation of the well location and construction, including pump intake depth, and that the well was constructed and usable before project pumping was initiated. The mitigation of impacts shall be determined as follows:
  - a. If project pumping has lowered water levels by five feet or more and increased pumping lifts, increased energy costs shall be calculated. Payment or reimbursement for the increased costs shall be provided at the option of the affected well owner on an annual basis. In the absence of specific electrical use data supplied by the well owner, the project owner shall use **SOIL & WATER-5** to calculate increased energy costs.
  - b. If groundwater monitoring data indicate project pumping has lowered water levels below the top of the well screen, and the well yield is shown to have decreased by 10 percent or more of the pre-project average seasonal yield, compensation shall be provided for the diagnosis and maintenance to treat and remove encrustation from the well screen. Reimbursement shall be provided at an amount equal to the customary local cost of performing the necessary diagnosis and maintenance for well screen encrustation. Should the well yield reductions be recurring, the project owner shall provide payment or reimbursement for periodic maintenance throughout the life of the project. If with treatment the well yield is incapable of meeting 110

percent of the well owner's maximum daily demand, dry season demand, or annual demand the well owner should be compensated by reimbursement or well replacement as described under Condition 3.c.

- c. If project pumping has lowered water levels to significantly impact well yield so that it can no longer meet its intended purpose, causes the well to go dry, or cause casing collapse, payment or reimbursement of an amount equal to the cost of deepening or replacing the well shall be provided to accommodate these effects. Payment or reimbursement shall be at an amount equal to the customary local cost of deepening the existing well or constructing a new well of comparable design and yield (only deeper). The demand for water, which determines the required well yield, shall be determined on a per-well basis using well owner interviews and field verification of property conditions and water requirements compiled as part of the pre-project well reconnaissance. Well yield shall be considered significantly impacted if it is incapable of meeting 110 percent of the well-owner's maximum daily demand, dry-season demand, or annual demand – assuming the pre-project well yield documented by the initial well reconnaissance met or exceeded these yield levels.
- d. The project owner shall notify any owners of the impacted wells within one month of the CPM approval of the compensation analysis for increased energy costs.
- e. Pump lowering – In the event that ground water is lowered as a result of project pumping to an extent where pumps are exposed but well screens remain submerged the pumps shall be lowered to maintain production in the well. The project shall reimburse the impacted well owner for the costs associated with lowering pumps.
- f. Deepening of wells – If the ground water is lowered enough as a result of project pumping that well screens and/or pump intakes are exposed, and pump lowering is not an option, such affected wells shall be deepened or new wells constructed. The project owner shall reimburse the impacted well owner for all costs associated with deepening existing wells or constructing new wells shall be borne by the project owner.
1. After the first five-year operational and monitoring period, the CPM shall evaluate the data and determine if the monitoring program for water level measurements should be revised or eliminated. Revision or elimination of any monitoring program elements shall be based on the

consistency of the data collected. The determination of whether the monitoring program should be revised or eliminated shall be made by the CPM.

2. If mitigation includes monetary compensation, the project owner shall provide documentation to the CPM that compensation payments have been made by March 31 of each year of project operation or, if lump-sum payments are made, payment is made by March 31 following the first year of operation only. Within 30 days after compensation is paid, the project owner shall submit to the CPM a compliance report describing compensation for increased energy costs necessary to comply with the provisions of this condition.
3. At the end of every subsequent five-year monitoring period, the collected data shall be evaluated by the CPM and they shall determine if the sampling frequency should be revised or eliminated.
4. During the life of the project, the project owner shall provide to the CPM all monitoring reports, complaints, studies and other relevant data within 10 days of being received by the project owner.

**VERIFICATION:** The project owner shall do all of the following:

At least 60 days prior to operation of the site groundwater supply wells, the project owner shall submit to the CPM a comprehensive report presenting all the data and information required in item A above. The CPM would provide comments to the plan 15 days following submittal, and the final plan shall be approved 15 days prior to operation of the site groundwater supply wells. The project owner shall submit to the CPM all calculations and assumptions made in development of the report data and interpretations.

During project construction, the project owner shall submit to the CPM quarterly reports presenting all the data and information required in item B above. The quarterly reports shall be provided 30 days following the end of the quarter. The project owner shall also submit to the CPM all calculations and assumptions made in development of the report data and interpretations.

No later than March 31st of each year of construction, or 60 days prior to project operation, the project owner shall provide to the CPM for review and approval, documentation showing that any mitigation to private well owners during project construction was satisfied, based on the requirements of the property owner as determined by the CPM.

During project operation, the project owner shall submit to the CPM applicable quarterly, semi-annual and annual reports presenting all the data and information required in item

C above. Quarterly reports shall be submitted to the CPM 30 days following the end of the quarter. The fourth quarter report shall serve as the annual report and shall be provided on January 31st in the following year.

The project owner shall submit to the CPM all calculations and assumptions made in development of report data and interpretations, calculations, and assumptions used in development of any reports.

After the first five year operational and monitoring period, the project owner shall submit a 5-year monitoring report to the CPM that includes all monitoring data collected and a summary of the findings. The CPM would determine if the water level measurements and water quality sampling frequencies should be revised or eliminated.

### **COMPENSATION FOR WELL IMPACTS**

**SOIL & WATER-5** Where it is determined that the project owner shall reimburse a private well owner for increased energy costs identified as a result of analysis performed in Condition of Certification **SOIL & WATER-4**, the project owner shall calculate the compensation owed to any owner of an impacted well as described below.

$$\text{Increased cost for energy} = \text{change in lift/total system head} \times \text{total energy consumption} \times \text{costs/unit of energy}$$

Where:

$$\text{change in lift (ft)} = \text{calculated change in water level in the well resulting from project}$$

$$\text{total system head (ft)} = \text{elevation head} + \text{discharge pressure head}$$

$$\text{elevation head (ft)} = \text{difference in elevation between wellhead discharge pressure gauge and water level in well during pumping.}$$

$$\text{discharge pressure head (ft)} = \text{pressure at wellhead discharge gauge (psi)} \times 2.31$$

The project owner shall submit to the CPM for review and approval the documentation showing which well owners must be compensated for increased energy costs and that the proposed amount is sufficient compensation to comply with the provisions of this condition.

- Any reimbursements (either lump sum or annual) to impacted well owners shall be only to those well owners whose wells were in service within six months of the Commission decision and within a 5-mile radius of the project site.

- The project owner shall notify all owners of the impacted wells within one month of the CPM approval of the compensation analysis for increase energy costs.
- Compensation shall be provided on either a one-time lump-sum basis, or on an annual basis, as described below.

Annual Compensation: Compensation provided on an annual basis shall be calculated prospectively for each year by estimating energy costs that would be incurred to provide the additional lift required as a result of the project. With the permission of the impacted well owner, the project owner shall provide energy meters for each well or well field affected by the project. The impacted well owner to receive compensation must provide documentation of energy consumption in the form of meter readings or other verification of fuel consumption. For each year after the first year of operation, the project owner shall include an adjustment for any deviations between projected and actual energy costs for the previous calendar year.

One-Time Lump-Sum Compensation: Compensation provided on a one-time lump-sum basis shall be based on a well-interference analysis, assuming the maximum project-pumping rate of 300 AFY. Compensation associated with increased pumping lift for the life of the project shall be estimated as a lump sum payment as follows:

- The current cost of energy to the affected party considering time of use or tiers of energy cost applicable to the party's billing of electricity from the utility providing electric service, or a reasonable equivalent if the party independently generates their electricity;
- An annual inflation factor for energy cost of 3 percent; and
- A net present value determination assuming a term of 30 years and a discount rate of 9 percent;

**VERIFICATION:** The project owner shall do all of the following:

No later than 30 days after CPM approval of the well draw-down analysis, the project owner shall submit to the CPM for review and approval all documentation and calculations describing necessary compensation for energy costs associated with additional lift requirements.

The project owner shall submit to the CPM all calculations, along with any letters signed by the well owners indicating agreement with the calculations, and the name and phone numbers of those well owners that do not agree with the calculations.

Compensation payments shall be made by March 31st of each year of project operation or, if lump-sum payment is selected, payment shall be made by March 31st of the first year of operation only. Within 30 days after compensation is paid, the project owner shall submit to the CPM a compliance report describing compensation for increased energy costs necessary to comply with the provisions of this condition.

## **WASTE DISCHARGE REQUIREMENTS**

**SOIL & WATER-6** The project owner shall comply with the requirements specified in **Appendices B, C, and D**. These requirements relate to discharges, or potential discharges, of waste that could affect the quality of waters of the state, and were developed in consultation with staff of the SWRCB and the Colorado River Basin Regional Water Quality Control Board (CRBRWQCB) (hereafter "Water Boards"). It is the Commission's intent that these requirements be enforceable by both the Commission and the Water Boards. In furtherance of that objective, the Commission hereby delegates the enforcement of these requirements, and associated monitoring, inspection and annual fee collection authority, to the Water Boards. Accordingly, the Commission and the Water Boards shall confer with each other and coordinate, as needed, in the enforcement of the requirements. The project owner shall pay the annual waste discharge permit fee associated with this facility to the Water Boards. In addition, the Water Boards may "prescribe" these requirements as waste discharge requirements pursuant to Water Code section 13263 solely for the purposes of enforcement, monitoring, inspection, and the assessment of annual fees, consistent with Public Resources Code, section 25531, subdivision (c).

**VERIFICATION:** The project owner shall follow the groundwater quality monitoring requirements as provided in **SOIL & WATER-18** by providing a Groundwater Quality Monitoring and Reporting Plan 90 days prior to operation of water supply wells for construction activities. The plan shall provide methods and procedures for monitoring background water quality, and site groundwater quality related to operation of the waste management units. Well locations, groundwater sampling procedures and analytical methods shall be provided consistent with requirements stipulated in the Waste Discharge Requirements provided in **Appendices B, C, and D**.

No later than 60 days prior to any wastewater discharge or use of land treatment units, the project owner shall provide documentation to the CPM, with copies to the CRBRWQCB, demonstrating compliance with the WDRs established in **Appendices B, C, and D**. Any changes to the design, construction, or operation of the evaporation basins, treatment units, or storm water system shall be requested in writing to the CPM, with copies to the CRBRWQCB, and approved by the CPM, in consultation with the

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CRBRWQCB, prior to initiation of any changes. The project owner shall provide to the CPM, with copies to the CRBRWQCB, all monitoring reports required by the WDRs, and fully explain any violations, exceedances, enforcement actions, or corrective actions related to construction or operation of the evaporation basins or treatment units.

## **SEPTIC SYSTEM AND LEACH FIELD REQUIREMENTS**

**SOIL & WATER-7** The project owner shall comply with the requirements of the County of Riverside Ordinance Code, title 8, chapter 8.124 and the California Plumbing Code (California Code of Regulations, title 24, part 5) regarding sanitary waste disposal facilities such as septic systems and leach fields. The septic system and leach fields shall be designed, operated, and maintained in a manner that ensures no deleterious impact to ground water or surface water. Compliance shall include an engineering report on the septic system and leach field design, operation, maintenance, and loading impact to ground water.

**VERIFICATION:** The project owner shall submit all necessary information and the appropriate fee to the County of Riverside and the CRBRWQCB to ensure that the project has complied with county and state sanitary waste disposal facilities requirements. Written assessments prepared by the County of Riverside and the CRBRWQCB regarding the project's compliance with these requirements must be submitted to the CPM for review and approval 30 days prior to the start of power plant operation.

**Soil & Water-8: DELETED**

**Soil & Water-9: DELETED**

**Soil & Water-10: DELETED**

**Soil & Water-11: DELETED**

**Soil & Water-12: DELETED**

## **CLOSURE PLAN**

**SOIL & WATER-13** The project owner shall prepare both a Provisional Closure Plan and a Final Closure Plan that would meet the requirements of the BLM. The project owner shall identify likely closure scenarios and develop facility closure plans in accordance with **COM-15** "Facility Closure Plans" of the General Conditions. Actions to be taken to avoid or mitigate long-term impacts related to water and wind erosion after the facility's closure need to be identified. Actions may include such measures as a facility closure SWPPP, revegetation and restoration of disturbed areas, post-

closure maintenance, collection and disposal of project materials and chemicals, and access restrictions.

**VERIFICATION:** One (1) year after initiating commercial operation, the project owner must submit a Provisional Closure Plan and cost estimate for permanent closure to the CPM for review and approval. At least 3 years prior to closing, the owner must submit a Final Closure Plan to the CPM for review and approval. The project owner shall amend these documents as necessary, with approval from the CPM, should the facility closure scenario change in the future.

## **MITIGATION OF IMPACTS TO THE PALO VERDE MESA GROUNDWATER BASIN**

**SOIL & WATER-14** To mitigate the impact from project pumping, the project owner shall identify and implement offset measures to mitigate the increase in discharge from surface water to groundwater that affects recharge in the Palo Verde Valley Groundwater Basin (USGS). The project owner shall implement **SOIL & WATER-17** to evaluate the change in recharge over the life of the project including any latency effects from project pumping. The activities shall include the following water conservation projects: payment for irrigation improvements in Palo Verde Irrigation District, payment for irrigation improvements in Imperial Irrigation District, purchase of water rights within the Colorado River Basin that would be held in reserve, and/or the BLM's Tamarisk Removal Program or other proposed mitigation activities acceptable to the CPM.

The activities proposed for mitigation shall be outlined in a Water Offset Plan that would be provided to the CPM for review and approval and which shall include the following at a minimum:

- A. Identification of the water offsets as determined in **SOIL & WATER-17**;
- B. Demonstration of the project owner's ability to conduct the activity;
- C. Whether any governmental approval of the identified offset would be needed, and if so, whether additional approval would require compliance with CEQA or NEPA;
- D. Demonstration of how much water is provided by each of the offset measures;
- E. An estimated schedule for completion of the activities;
- F. Performance measures that would be used to evaluate the amount of water replaced by the proposed offset measure; and,

- G. A Monitoring and Reporting Plan outlining the steps necessary and proposed frequency of reporting to show the activities are achieving the intended benefits of the water supply offsets;

**VERIFICATION:** The project owner shall submit a Water Offset Plan to the CPM for review and approval 30 days before the start of extraction of groundwater for construction or operation.

The project owner shall implement the activities reviewed and approved in the Water Offset Plan in accordance with the agreed-upon schedule in the Water Offset Plan. If agreement with the CPM on identification or implementation of offset activities cannot be achieved, the project owner shall immediately halt construction or operation until the agreed upon activities can be identified and implemented.

### **GROUNDWATER PRODUCTION REPORTING**

**SOIL & WATER-15** The project is subject to the requirement of Water Code sections 4999 et seq., for reporting of groundwater production in excess of 25 acre-feet per year.

**VERIFICATION:** The project owner shall file an annual "Notice of Extraction and Diversion of Water" with the SWRCB in accordance with Water Code sections 4999 et seq. The project owner shall include a copy of the filing in the annual compliance report.

### **GROUND SUBSIDENCE MONITORING AND ACTION PLAN**

**SOIL&WATER-16** One monument monitoring station per production well or a minimum of three stations shall be constructed to measure potential inelastic subsidence that may alter surface characteristics of the Chuckwalla Valley near the proposed production wells. The project owner shall:

- A. Prepare and submit a Subsidence Monitoring Plan (SMP) that shall include the following elements:
  - 1. Construction diagrams of the proposed monument monitoring station including size and description, planned depth, measuring points, and protection measures;
  - 2. Map depicting locations (minimum of three) of the planned monument monitoring stations;
  - 3. Monitoring program that includes monitoring frequency, thresholds of significance, reporting format.
- B. Prepare quarterly reports commencing three (3) months following commencement of groundwater production during construction and operations.

1. The reports shall include presentation and interpretation of the data collected including comparison to the thresholds developed in Item C.
- C. Prepare a Mitigation Action Plan that details the following:
  1. Thresholds of significance for implementation of proposed action plan;
    - a. Any subsidence that may occur would not be allowed to damage existing structures either on or off the site or alter the appearance or use of the structure;
    - b. Any subsidence that may occur would not be allowed to alter the natural drainage patterns or permit the formation of playas or lakes;
    - c. Any subsidence that violates (a) or (b) would result in the project owner investigating the need to immediately reduce/cease pumping until the cause is identified or subsidence caused by project pumping abates and the structures and/or drainage patterns are stabilized and corrected.
  2. Proposed actions by the project owner in the event thresholds are achieved during the monitoring program.

The project owner shall submit the Ground Subsidence Monitoring and Action Plan that is prepared by an Engineering Geologist registered in the State of California 30 days prior to the start of extraction of ground water for construction or operation.

**VERIFICATION:** The project owner shall do all of the following:

1. At least 30 days prior to project construction, the project owner shall submit to the CPM, a comprehensive report presenting all the data and information required in item A above.
2. The project owner shall submit to the CPM all calculations and assumptions made in development of the SMP.
3. During project construction and operations, the project owner shall submit to the CPM quarterly reports presenting all the data and information required in item B above.
4. The project owner shall submit to the CPM all calculations and assumptions made in development of the report data and interpretations.
5. After the first 5 years of the monitoring period, the project owner shall submit a 5-year monitoring report to the CPM that submits all monitoring data collected and

provides a summary of the findings. The CPM would determine if the Ground-Subsidence Monitoring and Action Plan frequencies should be revised or eliminated.

## **ESTIMATION OF SURFACE WATER IMPACTS**

**SOIL & WATER-17** To further assess the impacts from project pumping, the project owner shall estimate the increase in discharge from surface water to groundwater that affects recharge in the Palo Verde Valley Groundwater Basin (PVVGB) (USGS). This estimate may be used for determining the appropriate offset volume in accordance with **SOIL & WATER-14**. The project owner shall do the following to provide an estimate for review and approval by the CPM:

1. The project owner shall conduct a detailed analysis of the affect from project pumping at the end of the 30-year operational period including the change in groundwater outflow from the CVGB to the Palo Verde Valley, and how the change in outflow may affect recharge of surface water to the PVVGB from the project's groundwater extraction activities. The detailed analysis shall include:
  - a. The conceptual model developed in the AFC and the Staff Assessment, for the CVGB and the Palo Verde Valley, and any changes resultant from further analysis in support of numerical modeling;
  - b. The use of an appropriately constructed groundwater model 1) for the eastern portion of the CVGB that describes the effect from project pumping on the outflow of ground water to the Palo Verde Valley, and 2) an appropriately constructed groundwater model of the Palo Verde Valley, inclusive of the mesa and floodplain. The models shall be coupled as appropriate to determine the effect from project pumping on the surface water recharge in the Palo Verde Valley. Each model shall be constructed in consideration of the following:
    - i. Horizontal and vertical geometry information gained through on- and off-site investigations conducted as part of the hydrogeological field investigations for the AFC, and any subsequently documented investigation performed as part of the model development ;
    - ii. Aquifer properties developed as part of the AFC and any subsequently documented investigations performed as part of the model development, and an assessment of aquifer properties available from other published sources. The properties used shall be representative of the available data; and

- iii. The modeling effort shall include a sensitivity analysis wherein the most sensitive variables would be identified and varied within a reasonable range outside of the calibration value to provide an assessment of the range of potential impacts from the project pumping on the recharge from the Palo Verde Valley Groundwater Basin.
  - c. Reporting of the results of the modeling effort.
  - d. Estimation of the increased contribution of surface water discharge to ground water and the change in recharge to the Palo Verde Valley Groundwater Basin attributable to project groundwater pumping.
2. The analysis shall include the following elements:
    - a. The change in groundwater flux to the regional aquifer from surface water sources attributable to project pumping in AFY for the life of the project (30 years) until pre-project conditions (within 95 percent) are achieved;
    - b. A sensitivity analysis that would provide a range in the potential changes in flux relative to variation in the key model variables within each model as a result of project pumping for life of the project until pre-project conditions (within 95 percent) are achieved;
  3. The project owner shall present the results of the conceptual model, numerical model, transient runs and sensitivity analysis in a report for review and approval by the CPM. The report shall include all pertinent information regarding the development of the numerical models. The report shall include as discussion of the following as appropriate to each model:
    - a. Introduction;
    - b. Previous Investigations;
    - c. Conceptual Model;
    - d. Numerical Model and Input Parameters;
    - e. Sensitivity Analysis ;
    - f. Transient Modeling Runs; and
    - g. Conclusions.

**VERIFICATION:** At least 90 days prior to initiation of groundwater pumping for grading operations of the proposed project, the project owner shall submit to the CPM for their review and approval a report detailing the results of the modeling effort. The report shall include the estimated amount of change in discharge from surface water to

groundwater within the Palo Verde Valley due to project pumping. This estimate shall be used for determining the appropriate volume of water for offset in accordance with **SOIL & WATER-14**.

## **GROUNDWATER QUALITY MONITORING AND REPORTING PLAN**

**SOIL & WATER-18** The project owner shall submit a Groundwater Quality Monitoring and Reporting Plan to the CPM for review and approval. The Groundwater Quality Monitoring and Reporting Plan shall provide a description of the methodology for monitoring background and site groundwater quality following the Waste Discharge Requirements of **SOIL & WATER-6**, to assess the effects from pumping on changes in the aquifer water chemistry, and to monitor potential impacts from operation of proposed septic leach fields, if required. The initial background water quality sampling shall be implemented during the background groundwater level monitoring events in accordance with **SOIL & WATER-4**. Prior to project construction, access to off-site wells shall be obtained and samples collected and monitoring wells shall be installed to evaluate background water quality in the shallow and deep regional aquifer in areas that would be affected by project pumping. These data would be used to establish pre-construction water quality that can be quantitatively compared against data gathered during construction and operation to assess if project pumping or a release from the waste management units (see **SOIL & WATER-6**), or septic systems (if required) has adversely affected the water supply or sensitive receptors.

1. A Groundwater Quality Monitoring and Reporting Plan shall be submitted to the CPM 90 days prior to operation of the water supply wells for construction. The plan shall include a scaled map showing the site and vicinity, existing well locations, and proposed monitoring locations (both existing wells and new monitoring wells proposed for construction). Additional monitoring wells that shall be installed include wells required in accordance with condition of certification **SOIL & WATER-6**, for the evaporation ponds and land treatment unit proposed for the project, and if required for the sanitary leach field system. The map shall also include relevant natural and man-made features (existing and proposed as part of this project). The plan also shall provide: (1) well construction information and borehole lithology for each existing well proposed for use as a monitoring well; (2) description of proposed drilling and well installation methods; (3) proposed monitoring well design; and, (4) schedule for completion of the work.

2. A Well Monitoring Installation and Groundwater Quality Network Report shall be submitted to the CPM for review and approval in conjunction with condition of certification **SOIL & WATER-4** and 60 days prior to operation of the water supply wells. The report shall include a scaled map showing the final monitoring well network. It shall document the drilling methods employed, provide individual well construction as-buils, borehole lithology recorded from the drill cuttings, well development, and well survey results. The well survey shall measure the location and elevation of the top of the well casing and reference point for all water level measurements, and shall include the coordinate system and datum for the survey measurements. Additionally, the report shall describe the water level monitoring equipment employed in the wells and document their deployment and use.

3. As part of the monitoring well network development, all newly constructed monitoring wells shall be constructed consistent with State and Riverside County specifications.

4. Prior to use of any ground water for construction, all groundwater quality and groundwater level monitoring data shall be reported to the CPM in the Well Monitoring Installation and Groundwater Quality Network Report that is due in conjunction with the background water level monitoring report under **SOIL & WATER-4** and 60 days prior to construction. The report shall include the following:

a. An assessment of pre-project groundwater levels, a summary of available climatic information (monthly average temperature and rainfall records from the nearest weather station), and a comparison and assessment of water level data relative to the assumptions and spatial trends simulated by the project owner's groundwater model;

b. An assessment of pre-project groundwater quality with groundwater samples analyzed for those constituents required under the Waste Discharge Requirements (**Appendices B, C and D**) and if not included total dissolved solids (TDS), chloride, nitrates, major cations and anions, oxygen-18 and deuterium isotopes, and soluble metals; and

c. The data shall be tabulated and include the estimated range (minimum and maximum values), average, and median for each constituent analyzed. If a sufficient number of data points are available from the background sampling, the data shall also be analyzed using the Mann-Kendall test for trend at 90 percent confidence to assess whether pre-project water quality trends, if any, are statistically significant.

5. During project construction and during the first five years of project operations, the project owner shall semi-annually monitor the quality of ground water and changes in groundwater elevation and submit data semiannually to the CPM one month following the end of the 1st and 3rd quarter and following the operation reporting requirement under **SOIL & WATER-4**. After five years of project operations, the frequency and scope of the monitoring program shall be reassessed by the CPM. The semi-annual report shall document water level monitoring methods, the water level data, water level plots, and a comparison between pre- and post-project start-up water level trends as itemized below. The report shall also include a summary of actual water use conditions, monthly climatic information (temperature and rainfall) from the nearest meteorological monitoring station, and a comparison and assessment of water level data relative to the assumptions and simulated spatial trends predicted by the project owner's groundwater model. The report shall set forth information compiled from the following sources:

a. Groundwater samples from all wells in the monitoring well network shall be analyzed and reported semi-annually for those constituents required in the Waste Discharge Requirements (**Appendices B, C and D**) and if not included TDS, chloride, nitrates, cations and anions, Oxygen-18 and deuterium isotopes.

b. For analysis purposes, pre-project water quality shall be defined by samples collected prior to project construction as specified above, and compliance data shall be defined by samples collected after the construction start date to determine the effects from project pumping and after the installation and operation of the waste management units in compliance with the Waste Discharge Requirements (**Appendices B, C and D**) and the sanitary leach fields, if required.

c. Trends in water quality data shall be analyzed using the Mann-Kendall test for trend at the 90 percent confidence. Trends in the compliance data shall be compared and contrasted to pre-project trends, if any.

d. The contrast between pre-project and compliance mean or median concentrations shall be compared using an Analysis of Variance (ANOVA) or other appropriate statistical method approved by the CRBRWQCB for evaluation of water quality impacts. A parametric ANOVA (for example, an F-test) can be conducted on the two data sets if the residuals between observed and expected values are normally distributed and have equal variance, or the data can be transformed to an approximately normal

distribution. If the data cannot be represented by a normal distribution, then a nonparametric ANOVA shall be conducted (for example, the Kruskal-Wallis test). If a statistically significant difference is identified at 90 percent confidence between the two data sets, the monitoring data are inconsistent with random differences between the pre-project and baseline data indicating a significant water quality impact from project pumping may be occurring.

e. If compliance data to evaluate the effects from project pumping or potential impacts from operation of sanitary leach field indicate that the water supply quality has deteriorated in (exceeds pre-project constituent concentrations in TDS, sodium, chloride, or other constituents identified as part of the monitoring plan and applicable Water Quality Objectives are exceeded for the applicable beneficial uses of the water supply) adjacent water supply wells that can be shown to be adversely influenced by project pumping for three consecutive years, the project owner shall provide well-head treatment or a new water supply to either meet or exceed pre-project water quality conditions to any impacted water supply wells.

**VERIFICATION:** The project owner shall complete the following:

At least 90 days prior to construction, a Groundwater Level and Quality Monitoring and Reporting Plan shall be submitted to the CPM for review and approval.

At least 60 days prior to construction, a Well-Monitoring Installation and Groundwater Level Network Report shall be submitted to the CPM for review and approval.

At least 60 days prior to use of any ground water for construction, all groundwater quality and groundwater level monitoring data shall be reported to the CPM.

On a semiannual basis, water quality data shall be collected during construction and 5 years following initial operation. The results of the monitoring would be reported on a semiannual basis, 1 month following the end of the 1st and 3rd quarters.

## **NON-TRANSIENT, NON-COMMUNITY WATER SYSTEM**

**SOIL & WATER-19** The project is subject to the requirement of California Code of Regulations, title 22, article 3, sections 64400.80 through 64445, for a non-transient, non-community water system (serving 25 people or more for more than 6 months). In addition, the system shall require periodic monitoring for various bacteriological, inorganic and organic constituents.

**VERIFICATION:** The project owner shall submit the equivalent County of Riverside requirements to operate a non-transient, non-community water system with the County of Riverside at least 60 days prior to commencement of operations at the site. In

addition, the project owner shall submit to the CPM a monitoring and reporting plan for production wells operated as part of the domestic water supply system prior to plant operations. The plan shall include reporting requirements including monthly, quarterly, and annual submissions.

The project owner shall designate a California Certified Water Treatment Plant Operator as well as the technical, managerial and financial requirements as prescribed by state law. The project owner shall supply updates on an annual basis of monitoring requirements, any required submittals equivalent to the County of Riverside requirements including annual renewal requirements.

## **STORM WATER DAMAGE MONITORING AND RESPONSE PLAN**

**SOIL & WATER-20** The project owner shall reduce impacts caused by large storms by ensuring heliostats and diversion channels withstand the 100-year storm event, establishing ongoing maintenance and inspection of storm water controls, and implementing a response plan to clean up damage and address ongoing issues.

The project owner shall ensure that the heliostats and diversion channels are designed and installed to withstand storm water scour that may occur as a result of a 100-year, 24-hour storm event. The project owner shall implement a fence inspection and repair program to repair fencing after major storm events. The analysis of the storm event and resulting heliostat stability would be provided within a Pylon Insertion Depth and Heliostat Stability Report to be completed by the project owner. This analysis would incorporate results from site-specific geotechnical stability testing, as well as hydrologic and hydraulic storm water modeling performed by the project owner. The modeling would be completed using methodology and assumptions approved by the CPM.

The project owner shall also develop a Storm Water Damage Monitoring and Response Plan to evaluate potential impacts from storm water, including damage to diversion channels, perimeter fencing, and heliostats that fail due to storm-water flow or otherwise break and scatter mirror debris or other potential pollutants on to the ground surface.

The basis for determination of pylon embedment depths shall employ a step-by-step process as identified below and approved by the CPM:

A. Determination of peak storm-water flow within each sub-watershed from a 100-year event:

- Use of Riverside County Flood Control and Water Conservation District Hydrology Manual (Riverside County Manual) to specify hydrologic parameters to use in calculations; and
- HEC-1 and Flo-2D models (or other approved models) would be developed to calculate storm flows from the mountain watersheds upstream of the project site, and flood flows at the project site, based upon hydrologic parameters from Riverside County.

A. Determination of potential total pylon scour depth:

- Potential channel erosion depths would be determined using the calculated design flows, as determined in A above, combined with Flo-2D to model on-site sediment transport.
- Potential local scour would be determined using the calculated design flows, as determined in A above, combined with the Federal Highway Administration (FHWA) equation for local bridge pier scour from the FHWA 2001 report “Evaluating Scour at Bridges.”

A. The results of the scour depth calculations and pylon stability testing would be used to determine the minimum necessary pylon embedment depth within the active channels. In the inactive portions of the alluvial fans that are not subject to channel erosion and local scour, the minimum pylon embedment depths would be based on the results of the pylon stability testing.

B. The results of the calculated peak storm water flows and channel erosion and heliostat scour analysis together with the recommended heliostat installation depths shall be submitted to the CPM for review and approval 60 days before the start of heliostat installation.

The Storm-Water Damage Monitoring and Response Plan shall be submitted to the CPM for review and approval and shall include the following:

- Detailed maps showing the installed location of all heliostats within each project phase;
- Description of the method of removing all soil spoils should any be generated;
- Each heliostat should be identified by a unique ID number marked to show initial ground surface at its base, and the depth of the pylon below ground;

- Minimum Depth Stability Threshold to be maintained of pylons to meet long-term stability for applicable wind, water (flowing and static), and debris loading effects;
- Above- and below-ground construction details of a typical installed heliostat;
- BMPs to be employed to minimize the potential impact of broken mirrors to soil resources;
- Methods and response time of mirror cleanup and measures that may be used to mitigate further impact to soil resources from broken mirror fragments; and
- Monitoring, documenting, and restoring the adjacent off-site downstream property when impacted by sedimentation or broken mirror shards.

A plan to monitor and inspect periodically, before first seasonal and after every storm event:

- Security and Tortoise Exclusion Fence: Inspect for damage and buildup of sediment or debris;
- Heliostats within drainages or subject to drainage overflow or flooding: Inspect for tilting, mirror damage, depth of scour compared to pylon depth below ground and the Minimum Depth Stability Threshold, collapse, and downstream transport;
- Drainage channels: Inspect for substantial migration or changes in depth, and transport of broken glass;
- Constructed diversion channels: Inspect for scour and structural integrity issues caused by erosion, and for sediment and debris buildup; and
- Adjacent off-site downstream property: Inspect for changes in the surface texture and quality from sediment buildup, erosion, or broken glass.

Short-Term Incident-Based Response:

- Security and Tortoise Exclusion Fence: repair damage, and remove built-up sediment and debris;
- Heliostats: Remove broken glass, damaged structure, and damaged wiring from the ground, and for pylons no longer meeting the Minimum

Depth Stability Threshold, either replace/reinforce or remove the mirrors to avoid exposure for broken glass;

- Drainage channels: no short-term response necessary unless changes indicate risk to facility structures; and
- Constructed diversion channels: repair damage, maintain erosion control measures and remove built-up sediment and debris.

Long-Term Design-Based Response:

- Propose operation/BMP modifications to address ongoing issues. Include proposed changes to monitoring and response procedures, frequency, or standards;
- Replace/reinforce pylons no longer meeting the Minimum Depth Stability Threshold or remove the mirrors to avoid exposure for broken glass; and
- Propose design modifications to address ongoing issues. This may include construction of active storm water management diversion channels and/or detention ponds.

Inspection, short-term incident response, and long-term design based response may include activities both inside and outside of the project boundaries. For activities outside of the project boundaries the project owner shall ensure all appropriate environmental review and approval has been completed before field activities begin.

**VERIFICATION:** At least 60 days prior to installation of the first pylon, the project owner shall submit to the CPM a copy of the Pylon Insertion Depth and Heliostat Stability Report for review and approval prior to construction. At least 60 days prior to commercial operation, the project owner shall submit to the CPM a copy of the Storm-Water Damage Monitoring and Response Plan for review and approval prior to commercial operation. The project owner shall retain a copy of this plan on site at the power plant at all times. The project owner shall prepare an annual summary of the number of heliostats failed due to damage, cause and extent of the damage, and cleanup and mitigation performed for each damaged heliostat. The annual summary shall also report on the effectiveness of the diversion channels against storms, including information on the damage and repair work or associated erosion control elements. The project owner shall submit proposed changes or revisions to the Storm-Water Damage Monitoring and Response Plan to the CPM for review and approval.

## SOIL AND WATER RESOURCES – APPENDIX B

### FACTS FOR WASTE DISCHARGE — PALEN SOLAR HOLDINGS, LLC,

#### Owner/Operator, Palen Solar Electric Generating System, Riverside County

1. Palen Solar Holdings, LLC, (the Discharger) is proposing to construct, own and operate a concentrated solar power tower (CSP) electric generating facility and evaporation ponds on land owned by the Bureau of Land Management (BLM). The solar power tower project is proposed by Palen Solar Holdings, LLC (PSH) a company jointly owned by BrightSource Energy and Abengoa Solar, LLC. The project is located in the Chuckwalla Valley along the Interstate 10 corridor (I- 10), east of Desert Center and west of the City of Blythe. The facility is referred to as the Palen Solar Electric Generating System (PSEGS or Project). A site map (**Soil and Water Resources Appendix B Figure 1**), as incorporated herein and made a part of these requirements for waste discharge (Waste Discharge Requirements, or WDRs). The address for PSH is 1999 Harrison Street, Suite 2150, Oakland, CA 94612.
2. These WDRs regulate the Facility's two evaporation ponds. The evaporation ponds are designated as Class II Surface Impoundments Waste Management Units (WMU) and must meet the requirements of the California Code of Regulations (CCRs), Title 27, CCR §20200 et seq. The boundaries of the PSEGS are shown on (**Soil and Water Resources Appendix B Figure 2**), as incorporated herein and made a part of these WDRs.
3. The Discharger submitted one Report of Waste Discharge (ROWD), on May 25, 2010 for the evaporation ponds for the PSEGS.
4. Definition of terms used in these WDRs:
  - a. **Facility** – The entire parcel of property where the proposed PSEGS industrial operation or related solar industrial activities are conducted.
  - b. **Waste Management Units (WMUs)** – The area of land, or the portions of the Facility where wastes are discharged. The evaporation ponds are WMUs.
  - c. **Discharger** – The term Discharger means any person who discharges waste that could affect the quality of the waters of the State, and includes any person who owns the land, WMU or who is responsible for the operation of a WMU. Specifically, the terms “discharger” or “dischargers” in these WDRs means PSH.

## Facility Location

5. The Facility site is located approximately 0.5 mile north of I-10 and approximately 10 miles east of Desert Center, in an unincorporated area of eastern Riverside County, California (**Soil and Water Resources Appendix B Figure 1**). Desert Center (population 125) is located along I-10 approximately halfway between the cities of Indio and Blythe, California, and is approximately three miles east of the southeast end of Joshua Tree National Park. The area inside the Project's security fence, the footprint within which all Project facilities will be located, will occupy approximately 2,970 acres of Federal land managed by the BLM.

## Surrounding Land Use

6. The Project site lies on 2,970 acres of vacant undeveloped desert located approximately 0.5 mile north of I-10 and 12 miles east of the small rural community of Desert Center. The Project site is not located in a designated wilderness area; however, it is located near lands that are designated as wilderness lands or Areas of Critical Environmental Concern (ACEC) (NECO Maps 2-38 and 2-4). The nearest Federal wilderness areas are located in mountainous land to the northeast and south of the Project site and referred to as the Palen/McCoy and Chuckwalla Mountains, respectively. The Chuckwalla Mountains are also designated by BLM as a Desert Wildlife Management Areas (DWMA); the Chuckwalla DWMA is located less than one mile south of the site and south of I-10. The Palen Dry Lake and dunes, located to the northeast of the Project site, are designated as ACEC. The edge of designated desert tortoise critical habitat extends into approximately 180 acres of the southwestern portion of the Facility.
7. South of I-10 is undeveloped public and private desert land. Undeveloped and irrigated desert is located west of the site where several large parcels are actively farmed. The nearest residence is located approximately 25 feet north of the Project's ROW boundary and approximately 1,000 feet from Unit #2. One other residence is located approximately 3,500 feet north of the Project boundary. No other residences are known to exist within the one-mile radius of the Project site.
8. The Project site is vegetated with desert scrub throughout and includes some sand dunes in the northeast. Several dirt roads and transmission lines cross the Project site, as well as four desert northeast-southwest trending washes. Based on information in Northern and Eastern Colorado Desert (NECO) Plan, the Project site has not been leased for grazing by BLM. The nearest grazing lands are the Ford Dry Lake grazing allotment approximately 10 miles east of the site and north of I-10.

9. The site is currently undeveloped and few off-highway vehicle tracks were observed. The site does not appear to be frequented as a recreational area. No portion of the Facility is known to be an active recreational area.
10. The NECO Plan does not identify any scenic resources in the Project Study Area. The County of Riverside has identified the I-10 corridor as eligible for county designation as a scenic corridor. The I-10 corridor between Palm Springs and Blythe is not designated by the State of California as a scenic corridor.

### **Facility Description**

11. The PSEGS is comprised of two, nominally rated 250 MW power blocks. The performance of each power block will vary with solar radiation and ambient temperature levels. At optimal solar radiation and low air cooled condenser back pressure (low ambient temperatures), the steam turbine-generator can produce 272 MW gross. As ambient temperature increases, the cooling effectiveness of the air cooled condenser decreases, causing the back pressure on the steam turbine to rise and, correspondingly, lowering steam turbine output. Parasitic loads also vary in relation to ambient temperature, due to the increasing power requirement for the large air cooled condenser and cooling plant auxiliary equipment. At an ambient temperature of 96°F, the steam turbine generator will produce 264 MW and plant parasitic load will be approximately 29 MW providing a net-to-grid power block rating of approximately 235 MW. Conversely, on a cool winter day with optimal solar radiation, the steam turbine generator will produce 272 MW, plant parasitic load will be approximately 28 MW and the net-to-grid power block rating will be approximately 244 MW.
12. The Project proposes to use dry cooling condenser for power plant cooling. Water for cooling tower makeup, process water makeup, and other industrial uses such as mirror washing will be supplied up to ten onsite wells. This source will also be used to supply water for employee use (e.g., drinking, showers, sinks, and toilets). Water received from the on-site wells will be pumped directly to a reverse osmosis (RO) treatment unit to meet the requirements of the California Department of Health Services for potable water supplies. Power cycle makeup, mirror washing water, and cooling of ancillary equipment will require on-site treatment for reduction of dissolved solids, and this treatment varies according to the quality required for each of these uses.
13. The power generation cycle will not produce cooling tower blow down because the plant will be dry cooled. A small auxiliary cooling tower will generate a small amount of blow down, which will be reused on-site. No off-site backup cooling water supply is planned at this time.

14. The main waste stream at the site consists of industrial wastewater generated in the various processes associated with power generation. Industrial wastewater is treated via a high pH reverse osmosis at each of the two Power Units. At each Unit, the treated water is recycled to the 800,000-gallon Service/Fire Water tank for reuse in the process. The concentrate from the RO system is discharged to lined evaporation ponds (one per Unit). The PSEGS Facility therefore includes two proposed evaporation ponds for waste storage and disposal. Sanitary wastewater generated at each Unit is disposed of via septic systems.
15. The project will include evaporation ponds for the evaporation of brine waste from the RO plant and other industrial wastes. There will be two ponds, two acres in size and, both located next to the common area (**Soil and Water Resources Appendix B Figure 2**). The evaporation ponds will be designed in accordance with Colorado River Basin Regional Water Quality Control Board (Regional Board) requirements.
16. The estimated project life for the Project is 30 years. Personnel will staff the Project 24 hours per day/seven days per week. Even when the solar power plant is not operating, personnel will be present as necessary for maintenance, to prepare the Project for startup, and/or for site security.
17. A sanitary septic system and on-site leach field will be used to dispose of sanitary wastewater within each power block.

## Climate

18. The Project is located in an arid desert climate; therefore, there are extreme daily temperature changes, low annual precipitation, strong seasonal winds and mostly clear skies. Evaporation rates are higher than precipitation rates. Based on 60 years of data from Blythe Airport, the mean maximum temperatures in June to September exceed 100°F. Winter months are more moderate with mean maximum temperatures of high 60's to low 70's °F and minimum temperatures in the low to mid 40's °F. Although there are no average minimal temperatures below freezing point (32°F), the temperature has historically dropped below freezing point between November and March.
19. Average annual evaporation in the Facility area, based on published data at the Indio Fire Station 70 miles west of the Project site, is 105 inches, of which 87 percent of that evaporation occurs between March and October. Average annual precipitation in the Project area, based on the gauging station at Blythe Airport, is 3.55 inches, with August recording the highest monthly average of 0.63 inches and June recording the lowest monthly average of 0.02 inches. Per the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 for the Southern

California area, 3.51 inches of rainfall shall fall in the 100 year, 24 hour storm event.

20. Winds in the Project area are generally south to southwest with a less frequent component of northerly winds (north through northwest). Calm conditions occur approximately 16.43% of the time, with the annual average wind speed being approximately 7.62 miles per hour (mph) (3.41 m/s).

### **Regional Topography and Drainage**

21. The Project site is located on the alluvial sediments of the Chuckwalla Valley, and is 2 to 3 miles northeast of the Chuckwalla Mountains and approximately two miles southwest of the Palen Mountains. Surface water in the Chuckwalla Valley drains from the surrounding mountains toward Palen or Ford Dry Lakes (playas), the topographic low points within the valley.
22. Site topography slopes gently to the northeast at grades of 1.4 percent or less. The general storm water flow pattern is from the higher elevations in the Chuckwalla Mountains, located approximately 6 miles southwest of the site, to the lower elevations in Chuckwalla Valley to the northeast. The site is mostly flat, with elevation ranging on United States Geological Survey (USGS) topographical maps from a high of about 625 feet above sea level at the southwestern limits of the site to a low of about 425 feet above sea level along the eastern site boundary. Storm water from the Project site flows to the northeast across the site and then southeast to a dry lake bed (Ford Dry Lake), which also receives overland flow from the Palen Mountains and the area toward I-10.
23. The major watercourse in the Project area is Corn Springs Wash, which drains approximately 31 square miles of the Chuckwalla Mountains and flows northeast toward the Project site. Storm water flows and discharge from springs in the Chuckwalla Mountains travel through Corn Springs Wash and adjacent unnamed washes northeastward before being cut off by I-10. Storm water flows are intercepted by dikes located south of I-10 and conveyed to three box culverts that cut beneath the roadway of I-10, south (upgradient) of the Project site. These structures were constructed during construction of I-10 and are dikes and culverts that re-concentrate the flows back to three discrete discharge points on the north side of I-10. From these discharge points, storm water flows continue across the Project site flowing northeast towards Palen Mountains.
24. Impacts to the ephemeral washes within the Project site will be mitigated by rerouting the washes in two new channels around the east and west sides of the facility and one through the center of the site (between Units #1 and #2). The new channels will be designed to be wildlife friendly, and drainage downstream of the site maintained as close as practicable to the pre-existing conditions.

Storm Water Pollution Prevention Plans (SWPPP) and a CEC mandated Drainage, Erosion, and Sediment Control Plan (DESCP) were provided in the August 2009 PSPP Application for Certification and contain Best Management Practices (BMPs), which will be implemented to avoid significant drainage/stormwater runoff and water quality impacts.

### **Flood Hazard**

25. According to FEMA, no flood insurance rate maps have been created for the Project site and adjacent areas. Reviews of flood zone maps generated by the Riverside County Flood Control District also did not identify any flood zone maps for this area of Riverside County.

### **Regional Geology**

26. The Facility is located in the northwestern Colorado Desert, in the alluvial-filled basin of the Palo Verde Mesa, which is part of the greater Colorado Desert Geomorphic Province. The basin is bound by the McCoy Mountains to the west, the Little Maria Mountains to the northwest, and the Big Maria Mountains to the northeast. This area has a generally low relief until near the surrounding mountains. In the region, the Palo Verde Valley is roughly equivalent to the recent historic floodplain of the Colorado River. Surficial deposits of late Miocene to Holocene age form most of the land surface in the area. Most of these deposits are composed of Quaternary Alluvium, underlain by the Pliocene Bouse Formation, which is in turn unconformably underlain by the Miocene Fanglomerate. These deposits are all underlain by bedrock consisting of metamorphic and igneous intrusive rocks of pre-Tertiary age, including Proterozoic schist and gneiss, Paleozoic sedimentary rocks, and Mesozoic sedimentary and metavolcanic rock sequences.

### **Site Specific Geology**

27. The Project is located in the alluvial-filled basin of the Chuckwalla Valley. Regionally, this valley formed as a structural depression or a pull-apart basin and is composed of two broad geologic units: consolidated rocks and unconsolidated alluvium (DWR 1963, 1979). The consolidated rocks consist of pre-Tertiary age igneous and metamorphic rocks, which form the basement complex, and in some locations, Tertiary-age volcanic rocks that overlie the basement complex. The consolidated rocks are nearly impermeable except for areas where fracturing or weathering has occurred. It is uncertain the extent that these rocks yield water to the alluvium. Some literature indicates that the fractured bedrock is in communication with the alluvium and there are wells that are completed in the bedrock that yield sufficient quantities of water. The flux of groundwater into and out of the bedrock is unknown.

## Seismicity

28. The Project site is located in seismically active Southern California, a region that has experienced numerous earthquakes in the past. A review of the Alquist Priolo (AP) Earthquake Fault Maps and the Riverside County AP Earthquake Hazard Zone Map indicate that there are no AP fault zones present within the Project boundaries (California Division of Mines and Geology 2000, California Geological Survey 2003, 2007). In addition, no active fault zones are present within one mile of the Project site; however, the site is approximately 2.5 miles southwest of an unnamed fault located at the southern end of the Palen Mountains. This fault has not been mapped by the USGS as a Quaternary (sufficiently active) fault, and is not listed by the EQFAULT program as a fault potentially affecting the site (Blake 2000).
29. Regardless of whether there are faults across the site, because the Project is located in a seismically active area, all Project structures must be designed to comply with the California Building Code (CBC) and Universal Building Code (UBC) Zone 4 requirements. The CBC and UBC are considered to be standard safeguards against major structural failures and loss of life. The goals of the codes are to provide structures that will:
  - a. Resist minor earthquakes without damage;
  - b. Resist moderate earthquakes without structural damage but with some nonstructural damage; and
  - c. Resist major earthquakes without collapse but with some structural and nonstructural damage.
30. The CBC and UBC base seismic design on minimum lateral seismic forces ("ground shaking"). The CBC and UBC requirements operate on the principle that providing appropriate foundations, among other aspects, helps to protect buildings from failure during earthquakes.
31. The Project site is located in seismically active Southern California, a region that has experienced numerous earthquakes in the past. A review of the Alquist Priolo (AP) Earthquake Fault Maps and the Riverside County AP Earthquake Hazard Zone Map indicate that there are no AP fault zones present within the Project boundaries (California Division of Mines and Geology 2000, California Geological Survey 2003, 2007).

## Ground Rupture

32. The Project site is not located within a State of California Earthquake Fault Zone designated by the Alquist-Priolo Special Studies Zone Act of 1972 (formerly known as a Special Studies Zone), an area where the potential for fault rupture is

considered probable (Riverside County, 2008). In addition, no Quaternary, Sufficiently Active, or Well Defined Faults are located under or near the Site. Based on this information and engineering judgment, earthquake induced ground rupture is not considered to be a significant hazard at the Site.

### **Slope Stability**

33. The Project site is not considered to be an area with the potential for permanent ground displacement due to earthquake-induced landslides because surface topography at and near the site is relatively flat (Riverside County, 2008). A review of the Riverside County General Plan, Safety Element, did indicate areas considered susceptible to earthquake induced landslides and rock falls in the McCoy Mountains; however, these areas are several miles from the Site and are not expected to impact the Project. Based on this information and engineering judgment, slope instability is not considered to be a significant hazard at the Site.

### **Erosion**

34. Erosion is the displacement of solids (soil, mud, rock, and other particles) by wind, water, or ice and by downward or down-slope movement in response to gravity. Due to generally flat terrain, the Project site is not prone to significant mass wasting (gravity-driven erosion and non-fluvial sediment transport) at present. The Riverside County General Plan, Safety Element (Riverside County, 2008), indicates the Site is in an area with moderate potential for wind erosion, the off-site linears are in areas with moderate to high potential for wind erosion. Soil characteristics at the Project site allow for the potential for wind and water erosion, and significant sediment transport currently occurs across the valley axial drainage that crosses the majority of the proposed plant site. As indicated above, these valley axial deposits are characterized by subdued bar and swale topography and ongoing deposition from sheet floods. Limited sand and aeolian erosion also occurs between depositional episodes.
35. To address the management of sediment transport, erosion and sedimentation during operation, the project design will incorporate diversion berms, channels, and dispersion structures. The final design for these features will be developed during detailed design, and will include industry-standard calculations and modeling to reduce the potential for erosion or sedimentation, and to reduce the need for ongoing maintenance. Dirt roads and exposed surfaces will be periodically treated with dust palliatives as needed to reduce wind erosion. Construction and maintenance of the proposed drainage and sediment management system at the Site is expected to reduce water and wind erosion at and downstream of the Site to less than significant levels.

## **Liquefaction**

36. Liquefaction is a soil condition in which seismically induced ground motion causes an increase in soil water pressure in saturated, loose, uniformly-graded sands, resulting in loss of soil shear strength. As a result, the effects of liquefaction can include loss of bearing strength, differential settlement, ground oscillations, lateral spreading, and flow failures or slumping. Liquefaction occurs primarily in areas where the groundwater table is within approximately 50 feet of the surface (Riverside County, 2008). The depth to water beneath the Site is estimated to be approximately 195 feet bgs. In addition, the sandy soils encountered in the upper 100 feet beneath the Project site during geotechnical drilling are generally dense and well graded. Dense, well-graded sands are not generally considered susceptible to liquefaction. Based on this information and engineering judgment, the potential for liquefaction hazard at the Project site is considered to be low. The potential for liquefaction will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

## **Differential Settlement**

37. Seismically induced settlement can occur during moderate and large earthquakes in soft or loose, natural or fill soils that are located above the ground water table, resulting in differential settlement. The settlement can cause damage to surface and near-surface structures. The most susceptible soils are clean loose granular soils. Due to the expected dense to very dense nature of the near surface soils, the potential for damage due to seismically induced settlement is considered to be low at the Project site. The potential for seismically-induced settlement will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

## **Collapsible Soil Conditions**

38. Alluvial soils in arid and semi-arid environments can have characteristics that make them prone to collapse with increase in moisture content and without increase in external loads. Soils that are especially susceptible to collapse or hydrocompaction in a desert environment are loose dry sands and silts, and soils that contain a significant fraction of water soluble salts. Overall soil gradation observed at the Facility site trended from coarser- to finer-grained alluvial deposits as distance from the McCoy Mountains increased. The ground surface in the western portion of the Project site is dominated by areas of desert pavement with layers of flat-lying gravel overlying finer-grained sandy materials.

East toward Black Creek road, the surface becomes less dominated by desert pavement and becomes sandier. Soils observed at the Facility site have a low permeability and high runoff potential. Based on this data and engineering judgment, the site soils do not have a significant potential for hydrocompaction or collapse. The potential for hydrocompaction and soil collapse will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.

### **Expansive Soil**

39. Expansive soil is predominantly fine grained and contains clay minerals capable of absorbing water in their crystal structure. It is often found in areas that were historically a flood plain or lake area, but can also be associated with some types of shale, volcanic ash or other deposits, and can occur in hillside areas also. Expansive soil is subject to swelling and shrinkage, varying in proportion to the amount of moisture present in the soil. As water is initially introduced into the soil (by rainfall or watering) expansion takes place. If dried out, the soil will contract, often leaving small fissures or cracks. Excessive drying and wetting of the soil can progressively deteriorate structures that are not designed to resist this effect, and can lead to differential settlement under buildings and other improvements. The surficial soils at the site generally consist of predominantly granular soils that do not contain much clay and are not subject to significant expansion hazards. The potential for expansive soils will be further evaluated as part of the Final Geotechnical Investigation for the Project, and if necessary, design parameters to address identified conditions will be incorporated into the detailed project design.
40. Based on the above information, the cut and fill slope dimensions and earthwork requirements will be adequate to address the stability of the evaporation ponds for the life of the Project and no further analysis is warranted.

### **Regional Hydrogeology**

41. The Recent-age (~11,000 years) younger alluvium consists of poorly-sorted gravel, sand, silt, and clay. The younger alluvium overlies the older geologic units as a thin veneer and is believed to be mostly above the water table. The Recent-age playa deposits consist mainly of clay, silt, and sand and occur in Ford and Palen Lakes and Hayfield Reservoir. During recent history, groundwater levels were shallower and groundwater likely discharged to Palen Dry Lake. Regional water level data suggests that water is possibly shallower than 25 feet below Palen Dry Lake, a depth which would suggest water may be lost or discharged through evapotranspiration. Recent groundwater levels below Ford Dry Lake

show the water to be about 50 feet below the surface of the lake. At this depth, it is unlikely that water is lost through evapotranspiration. The dune sand deposits occur on the lower elevations of the valley from the northwest end of Chuckwalla Valley to the eastern end of the valley, and just northeast of the Project site.

42. The older alluvium generally consists of fine to coarse sand inter-bedded with gravel, silt, and clay. The color ranges from dark brown to red, with abundant small white caliche nodules. This unit is assumed to be extensive, readily yields water to wells, and is considered the most important aquifer in the Chuckwalla Valley Groundwater Basin. It is believed that saturated sediments below the side to a depth of about 500 feet are older alluvial deposits.

### **Hydrostratigraphy**

43. The Pinto Formation consists of coarse fanglomerate and lacustrine clay with interbedded basalt. The DWR suggests (2004) that this unit yields limited quantities of water. Below the Pinto Formation, the PlioPleistocene Bouse Formation is comprised predominantly of coarse-grained fanglomerate deposits.
44. Well logs were located through reports published by the DWR and through information provided in various reports. There are two wells on the Project site and one has a boring log with lithologic information available in a report prepared by the DWR. The log for well 5S/17E-33N001 indicated surficial sands were encountered from the ground surface to 102 feet bgs; 18 feet of clay, sand and gravel were encountered from 102 feet to 120 feet bgs; clay was encountered between 120 and 208 feet bgs, sand and gravel were encountered from 208 to 216 feet bgs; clay streaks and sand were encountered from 216 feet to 556 feet bgs; and sand streaks and "sandstone cappings" were encountered within predominantly fine-grained materials between 556 feet and 758 feet bgs. It is possible that sediments encountered to a depth of 556 feet bgs are older alluvial deposits. The log of well 5S/17E-33N001 does not have sufficient detail to readily discern the contact between the units reported for the Chuckwalla Valley Groundwater Basin.
45. Boring logs could be found for only approximately 10 percent of the wells that were identified from an online database and literature within the basin. Available information provided in these logs was used to provide an understanding of subsurface conditions and develop a generalized geologic cross section for the Chuckwalla Valley Groundwater Basin. The limited geologic data revealed general variations in the sediments from the west to the east. In general, very few wells were drilled to the top of the basement or base of the fresh water in the Chuckwalla Valley Groundwater Basin. One well located on the eastern edge of

the basin, due west of the gap to the Palo Verde Groundwater Basin, was drilled to a depth of about 1,200 feet bgs, where it encountered bedrock.

46. In general, sediments on the western and eastern portions of the valley, and along the fringes of the basin are comprised of a higher percentage of coarsegrained sediments. These deposits are the proximal facies of coalescing alluvial fans. In the central portion of the valley and below the Project, sediments are generally composed of a much higher percentage of clay with subordinate amount of sand that occurs as layered inter-beds. These deposits have been interpreted as lacustrine deposits in the central portion of the basin. The wells located along the central portion of the valley and shown on the axial cross section through the valley appear to be completed within an inter-bedded sequence of alluvial fan and lacustrine deposits. Shallow sediment encountered below the Project consisted of very fine-grained silty sand and sand, suggesting distal fan facies. Interbedded clay with these sediments is probably lacustrine deposits. While the data is not conclusive these deposits to a depth of 538 feet are probably in the older alluvium.
47. The basal portion of may be upper portions of the Bouse Formation. The deeper Fanglomerate was not encountered and it is likely that the Pinto Formation was also not found below the Project site based on the absence of interbedded basalt deposits.

### **On-site Drainage**

48. On-site storm water management for the completed facility will be provided through the use of source control techniques, site design and treatment control. The storm flows from the solar collector arrays will be treated through the use of swales, and ditches.
49. Locations within the power block for the potential of chemical or oil releases will be fully contained. Rainfall within the containment areas will be allowed to evaporate or will be drained through an oil water separator. Locations within the power block where “contact” storm water may occur will be contained within a system of curbs or trenches. Drains from these curbed areas or containment trenches will be directed to an oil water separator. The oil separated and captured within the oil water separator will be trucked off-site to a licensed disposal/recycling facility. Clean water discharged from the oil water separator will be used on Project site by discharging it to the cooling tower or to the raw water storage tank. The water discharge from the oil water separator will not be discharged to the storm water system.

## **Facility Operational Water**

50. The Project will be dry cooled. The Project's various water uses include water for solar collector mirror washing, makeup for the SSG feed water, dust control, water for cooling plant auxiliary equipment, potable water and fire protection. Water needs for the Project will be met by use of groundwater pumped from wells on the Project site. The estimated water supply need for the Project operation is approximately 300 acre-feet per year.

## **Evaporation Ponds (Design and Installation Sequence)**

51. The containment strategy for the evaporation ponds is summarized as follows:
- a. Meet or exceed regulatory requirements for containment of waste fluids;
  - b. Select materials that are compatible with the physical, chemical and thermal characteristics of the water and contaminated soils being contained;
  - c. Protect against physical damage to the containment layers by including protective layers into the designs of each containment facility;
  - d. Allow for occasional removal of contained media without otherwise damaging the integrity of the containment systems; and
  - e. Include the ability to monitor the integrity of the containment system, to transfer fluids out of permeable layers on a continuous basis, and to transfer fluids from one evaporation pond to another.
52. Each 2.0 acre evaporation pond has a proposed design depth of seven feet which incorporates:
- a. Drying each pond at alternating four year intervals;
  - b. 3 feet of operational depth;
  - c. 2 foot of sludge build up over 4 years; and
  - d. 2 feet of freeboard.
53. The containment design for the evaporation ponds, from the surface of the evaporation ponds downwards, consists of the following:
- a. A hard surface / protective layer;
  - b. A primary 60 mil high density polyethylene (HDPE) liner;
  - c. An interstitial leak detection system (LDS) comprising a drainage layer and piping;
  - d. A secondary 40 mil HDPE liner;

- e. A 2 foot thick compacted silty-sand base; and
  - f. A moisture detection system.
54. The hard surface / protective layer provides protection against accidental damage to the HDPE liners which could be caused by burrowing animals, falling objects, varying climatic conditions and worker activities. Second, the hard surface / protective layer will allow for occasional removal of the precipitated solids within the evaporation ponds. Various hard surface media such as reinforced concrete, roller compacted concrete, revetments, or combinations of these media will be assessed prior to the selection of the preferred option.
55. High density polyethylene (HDPE) was selected as the preferred fabric for the primary and secondary liners for the following reasons:
- a. It is chemically resistant to potentially high concentrations of dissolved salts;
  - b. It is very durable during installation;
  - c. It is strong and possesses desirable stress-strain characteristics; and
  - d. It is the most common synthetic liner material and as such there is a broad base of practical experience associated with the installation of HDPE amongst construction contractors.
56. A 60 mil upper liner was selected to provide appropriate balance between strength and ductility characteristics, which is very important during liner installation. A non-woven geotextile will be installed on top of the 60 mil liner to act primarily as a protective layer. A 40 mil lower liner was selected for the lower and secondary liner to provide slightly better ductility and handling characteristics during installation, as strength is of lesser importance for the secondary liner. HDPE possesses large thermal expansion and contraction characteristics, and exhibits stress when liner temperature exceeds 122 °F. The temperature of the blowdown water is not expected to exceed 122°F.
57. A 2 foot thick basal layer of compacted silty sand is included in the design profile to protect the underlying groundwater in the unlikely event that both synthetic liner materials are punctured during construction or operation of the evaporation ponds. This base layer also serves to provide a smooth, competent surface to support the overlying synthetic liners and leak detection system layers.

### **Leak Detection System**

58. A drainage layer is included in the design profile for the evaporation ponds which consists of a granular drainage layer with perforated piping to collect and convey fluids to an extraction riser in a leak detection sump (LDS). Geocomposite

drainage materials, consisting of HDPE geonet and nonwoven geotextiles heat bonded to one or both sides, may be used in conjunction with or as a substitute for the granular drainage layer on slopes.

59. The water collected in the LDS will drain by gravity to a unique monitoring well that is constructed for each of the leak collection layer. Automated pneumatic, solar-powered pumping systems are included in the design of each of these monitoring wells to automatically return water to that pond, which in turn minimizes the hydraulic pressures across the secondary liners and therefore the risk of impact to groundwater quality.
60. The base of the evaporation pond leak detection and collection layer will slope at a minimum inclination of 1 percent to a leak collection trench. The trench will contain screened sand (with no fines) and a perforated pipe that will slope at a minimum inclination of 3/4 percent towards a leak detection and collection sump, located at the lowest point in the pond. The water in the collection sump will drain by gravity to a monitoring well that is constructed for each evaporation pond (one well per pond). Automated pneumatic pumping systems in the monitoring wells will automatically return water collected in the sump to that evaporation pond, which in turn minimizes the hydraulic pressures across the secondary liners and, therefore, minimizes the risk of leakage through the secondary liner. Leakage rates will be measured using a flow totalizer.
61. The collection sump, pipe, and monitoring well, will include prefabricated and field-fabricated HDPE components with water tight, extrusion welded and wedge-welded seams and penetrations. The liner system will be installed in accordance with current practices. Destructive and non-destructive testing procedures will be used to verify sump and penetration tightness and continuity.
62. This design is consistent with CCR Title 27, Section 20340, which requires an LDRS between the liners for the evaporation ponds.
63. The side slopes around the evaporation ponds will contain the same liner system as the base of the ponds, except that leak collection pipes will not be located on the pond side slopes.
64. The berms shall be covered with a minimum 6-inch thick road base or approved equivalent. The top of the berms will be a minimum of 2 feet above the surrounding grade to prevent potential inflow of stormwater.
65. The wastewater will come into contact with the hard surface/protective layer. The media for this layer will either be roller-compacted concrete or an approved equivalent alternate. All final media selection will be compatible with the wastewater by using quality concrete with maximum chemical resistance

(specifications will be provided to the concrete manufacturer to ensure proper mix selection).

66. If there is leakage in the evaporation pond, the wastewater will come into contact with the primary/secondary liner. HDPE is chemically resistant to saline solutions and long-term contact between the wastewater in the evaporation ponds and the HDPE liner system will not compromise liner integrity.
67. The hard surface/protective layers, liner system, and base layer will have the ability to withstand the dissolved solids content of the water without degradation. These systems will not fail due to pressure gradients from physical contact with the wastewater and residue or undergo chemical reactions or degradation.
68. The containment construction process will follow these general steps:
  - a. Prior to construction, the topsoil and subsoil covering the area will be stripped and stockpiled.
  - b. Placement and compaction of the silty sand base material;
  - c. Installation of the carrier pipe for the moisture detection (neutron probe) system beneath the base of the ponds;
  - d. Construction of finish grading to sub grade, as needed, and excavation of the leak collection trench and detection/collection sumps.
  - e. Scarification, moisture conditioning, compaction, proof rolling and testing of subgrade materials;
  - f. Installation of secondary HDPE liner;
  - g. Installation of leak detection layer, sump, and leak extraction risers;
  - h. Installation of primary HDPE liner;
  - i. Installation of the non-woven geomembrane liner;
  - j. Installation of granular fill;
  - k. Installation of liner protection layers; and
  - l. Hard surface placement.

### **Waste Classification**

69. Wastewater from several processes within the Facility will be piped to one 2.0-acre evaporation ponds per Unit for disposal. The pond area provides sufficient evaporative capacity to dispose of the anticipated wastewater stream, and allows for one pond to be taken out of service for up to approximately eight months for cleaning, potential future maintenance, and repair without impacting the

operation of the plant. Raw water for the Facility is supplied from groundwater wells. Discharge into the evaporation ponds is from one source:

- a. High pH RO (Reverse Osmosis Concentrate).

### **Wastewater Discharge**

70. The estimated concentrations of chemical constituents in the wastewater discharge to the evaporation ponds are provided in the **Table 1**, Raw Water Quality and Estimated Chemistry of Wastewater Flows. The total concentrations of chemical constituents estimated in the evaporation pond residue that will accumulate in the ponds during operation are provided in **Table 2**.
71. Classification of wastewater and evaporation pond residue is summarized in the Classification of Wastewater and Evaporation Pond Residue **Table 3** below.
72. Testing of this material will be conducted as part of the facility monitoring program to verify this characterization. The evaporation pond residue accumulated in the ponds is non hazardous; however, it does contain pollutants which could exceed water quality objectives if released, or that could be expected to affect the beneficial uses of waters of the state. Therefore, the evaporation pond residue is classified as a “designated waste.”

### **Evaporation Residue**

73. During the 30-year operating life of the Project, about 6,400 tons of evaporites will accumulate in the ponds. However, because it is anticipated that windblown silt will accumulate in the ponds at a rate of perhaps 6 inches per year, it will be necessary to clean out the ponds on approximately four-year intervals. Assuming 2 feet of silt accumulation, the sludge removed from the ponds will be approximately nine percent evaporite and 91 percent silt. The predicted chemical makeup of the evaporite, based on information about the raw water chemistry and knowledge of the water use and treatment processes at the Project, is summarized in **Soil and Water Resources Appendix B Table 3**.

### **Waste Management**

74. A Spill Prevention, Control, and Countermeasure (SPCC) Plan will be developed for the Project (refer to Section 13.4 for details).

### **Hazardous Waste**

75. There will be a variety of chemicals stored and used during construction and operation of the project. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards.

76. Hazardous materials will be stored in proper containers in material yards and designated construction areas. Cleanup materials (spill kits) will also be stored in these areas. Fuel, oil, and hydraulic fluids used in on-site vehicles will be transferred directly from a service truck to construction equipment and will not otherwise be stored on-site.
77. Designated, trained service personnel will perform fueling either prior to the start of the workday or at completion of the workday. Service personnel and construction contractors will follow SOPs for filling and servicing construction equipment and vehicles.
78. The evaporation ponds will not contain hazardous wastewater or sludge as it is illegal to discharge hazardous waste into surface impoundments under the Toxic Pits Cleanup Act of 1984.

### **Basin Plan**

79. The Water Quality Control Plan for the Colorado River Basin Region of California (Basin Plan) was adopted on November 17, 1993, and designates the beneficial uses of ground and surface water in this Region.
80. The Basin Plan designates beneficial uses for surface waters in each watershed of the Colorado River Basin region. Beneficial uses of surface waters within the Facility area and vicinity that could be impacted by the Facility include:
  - a. Agricultural use
  - b. Municipal use
  - c. Industrial use
  - d. Recreational use
  - e. Groundwater recharge
  - f. Wildlife habitat
  - g. Preservation of Rare, Threatened, or Endangered Species
81. The beneficial uses of ground water in the Imperial Hydrological Unit are:
  - a. Municipal Supply (MUN)
  - b. Industrial Supply (IND)
  - c. Agricultural supply

### **Monitoring Parameters**

82. Based on the chemical characteristics of the projected discharges to the evaporation ponds from wastewater, the following list of monitoring parameters

are required. These specific parameters are selected because they provide the best distinction between the wastewater and the groundwater in the Project area that can be used to differentiate a potential release that could change the chemical composition of the groundwater.

- a. Cations: Antimony, Arsenic, Barium, Cadmium, Calcium, Total Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Selenium, Zinc;
- b. Anions: Chloride and Sulfate; and
- c. Other: Total Dissolved Solids, Specific Conductivity, and pH.

### **California Environmental Quality Act (CEQA)**

83. The California Energy Commission (CEC) is the lead agency under the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) for all thermal power plants with power ratings of 50 MW or more. The CEC's power plant licensing process is a CEQA-equivalent process. The CEC will coordinate reviews and approvals with the regulatory agencies to ensure that the proposed project meets CEQA requirements. This includes obtaining these WDRs from the staff of the Regional Board. The CEC will certify this project and will include these WDRs as conditions of certification in accordance with the Warren-Alquist Act.<sup>2</sup>

### **Monitoring and Reporting Program**

84. The monitoring and reporting requirements in the Monitoring and Reporting Program (Appendix D), and the requirement to install groundwater monitoring wells, are necessary to determine compliance with these WDRs, and to determine the Facility's impacts, if any, on receiving water. All technical reports require the signature of a California Registered Professional Engineer or Professional Geologist.

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<sup>2</sup> The Warren-Alquist State Energy Resources Conservation and Development Act is the authorizing legislation for the California Energy Commission. The Act is codified at Public Resources Code (PRC) Section 25000 et seq.. PRC Section 25500 establishes the Commission's authority to certify all sites and related facilities for thermal power plants with power ratings of 50 megawatts or more. The section further declares that "the issuance of a certificate by the commission shall be in lieu of any permit, certificate, or similar document required by any state, local or regional agency, or federal agency to the extent permitted by federal law, for such use of the site and related facilities, and shall supersede any applicable statute, ordinance, or regulation of any state, local, or regional agency, or federal agency to the extent permitted by federal law."

**Soil and Water Resources Appendix B Table 1 –  
Raw Water Quality and Estimated Chemistry of Wastewater Streams**

	<b>Supply Water<sup>1</sup></b>	<b>Wastewater to Evaporation Pond<sup>2</sup></b>	<b>STCL<sup>3</sup></b>	<b>TCLP<sup>4</sup></b>
24-Average Flow Rate (GPM)	63	4.23	--	--
Peak Operation Flow Rate (GPM)	97		--	--
<b>Constituent</b>	(mg/L)			
<b>Cations</b>				
Calcium	31	3,000	--	--
Magnesium	4.7	640	--	--
Sodium	352	20,500	--	--
Potassium	4	370	--	--
Ammonia	< 0.1			
<b>Anions</b>				
M-Alkinity			--	--
Sulfate	380	15,000	--	--
Chloride	200	25,000	--	--
Nitrate	0,7	0.15	--	--
Silicon Dioxide		1,200	--	--
<b>General Water Quality</b>				
Bicarbonate	149		--	--

Carbonate	ND		--	--
OH				--
P-Alkalinity				
pH		5 - 7		--
Spec Cond			--	--
TDS	1010	72,000	--	--
Total Hardness (CaCO <sub>3</sub> )	830	4,200		
Turbidity				
Total Phosphate	< 0.31	2	--	--
Fluoride	6.1	140	180	--
Barium	31	3	--	--
Iron	< 100	11	--	--
Total Suspended Solids	1960		--	--
Biological Oxygen Demand	< 1		--	--

**Soil and Water Resources Appendix B Table 1 (Cont.) –  
Raw Water Quality and Estimated Chemistry of Wastewater Streams**

	Supply Water <sup>1</sup>	Wastewater to Evaporation Pond <sup>2</sup>	STCL <sup>3</sup>	TCLP <sup>4</sup>
<b>Trace Metals</b>				
Arsenic		0.43		
Boron	1.8		--	--
Chromium		0.2		
Copper	< 5	2	25	--
Manganese		0.7		
Molybdenum	73	2	350	--
Nickel		0.4		
Selenium		0.2		
Vanadium	< 5		24	--
Zinc	22	12	250	--
1. Water quality data from AFC Table Water 4, AECOM, 2009 2. Water Quality data from Palen Amendment Table 5.2-1, Palen 2012a 3. STCL = Soluble Threshold Limit Concentration, Regulated by CCR Title 22, Division 4.5, Article 3, Section 66261.24 4. TCLP = Toxicity Characteristics Leaching Procedure; Regulate under 40 CFR Section 261.24				

**Soil and Water Resources Appendix B Table 2 –  
Estimated Chemistry of Evaporation Pond Residue**

	Concentration in Evaporation Pond Discharge <sup>1</sup>	Total Residue Mass After 1 Year <sup>2</sup>	Concentration in 50% dry solids	Concentration with silt, 50% dry	STLC	TTLIC	TCLP
	(mg/L)	(lbs)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
Arsenic	0.43	0.0055	0.013	0.0012			
Barium	3	0.039	0.091	0.0082			
Chromium	0.2	0.0026	0.0061	0.00055			
Copper	2	0.026	0.061	0.0055			
Molybdenum	2	0.026	0.061	0.0055			
Nickel	0.4	0.0052	0.012	0.0011			
Selenium	0.2	0.0026	0.0061	0.00055			
Zinc	12	0.15	0.35	0.032			
Calcium	3000	39	91	8.2			
Magnesium	640	8.2	19	1.7			
Sodium	20500	260	610	55			
Potassium	370	4.8	11	0.99			
Iron	11	0.14	0.33	0.03			
Manganese	0.7	0.0090	0.021	0.0019			
Fluoride	140	1.8	4.2	0.38			

Chloride	25000	320	750	68			
Nitrate, as N	0	0	0	0			
Sulfate	0.15	0.0019	0.0044	0.00040			
Phosphate	2	0.026	0.061	0.0055			
Alkalinity, as CaCO <sub>3</sub>	4200	54	130	12			
Silica	1200	15	35	3.2			
pH	5-7	--	--	--			
TDS	7200.00	--	--	--			

Notes:

1. Concentration in Evaporation Pond Discharge based on Table 5.2-1 in the Petition for Amendment.
2. Based on daily flow of 4.23 g/d (16.01 l/d, 5,844.5 l/yr) from Project Water Balance.

**Soil and Water Resources Appendix B Table 3 –  
Classification of Wastewater and Evaporation Pond Residue**

Waste Stream	Waste Stream Compared To	Regulation	Waste Stream Characteristic	State & Federal Classification	CWC Section 13173 Classification
Wastewater	Soluble Threshold Limit Concentration (STLC)	CCR Title 22, Chapter 11, Division 4.5, Article 3, Section 66261.24 “Characteristics of Toxicity”	<STLC	Non-hazardous	Designated waste
	Toxicity Characteristic Leaching Procedure (TCLP)	Code of Federal Regulations (CFR) Part 261, Section 261.24	<TCLP	Non-hazardous	Designated waste
Evaporation Pond Residue	STLC	CCR, Title 22, Chapter 11, Division 4.5, Article 3, Section 66261.24 “Characteristics	<STLC	Non-hazardous	Designated waste

		of Toxicity”			
	Total Threshold Limit Concentration (TTL)	CCR, Title 22, Chapter 11, Division 4.5, Article 3, Section 66261.24 “Characteristics of Toxicity”	<TTL	Non-hazardous	Designated waste
	TCLP	Code of Federal Regulations (CFR) Part 261, Section 261.24	<TCLP	Non-hazardous	Designated waste

# Soil and Water Resource Appendix B Figure 1



**Legend**  
[Blue outline] Palen Solar Electric Generating System



## Soil and Water Resources Appendix B Figure 2



## **SOIL AND WATER RESOURCES – APPENDIX C**

### **REQUIREMENTS FOR WASTE DISCHARGE - PALEN SOLAR HOLDINGS, LLC, Owner/Operator, Palen Solar Electric Generating System, Riverside County**

#### **A. Discharge Specifications**

1. The treatment or disposal of wastes at this Facility shall not cause pollution or nuisance as defined in Sections 13050 of Division 7 of the California Water Code (CWC).
2. The Discharger will maintain the monitoring wells in good working order at all times. Well maintenance may include periodic well re-development to remove sediments.
3. Thirty (30) days prior to introduction of a new waste stream into the evaporation ponds, the Discharger must receive approval from the Regional Board's Executive Officer.
4. Waste material shall be confined or discharged to the evaporation.
5. Prior to drilling a new well or abandoning a well at the Facility, the Discharger shall notify, in writing, the Regional Board's Executive Officer of the proposed change.
6. Containment of waste shall be limited to the areas designated for such activities. Any revision or modification of the designated waste containment area, or any proposed change in operation at the Facility that changes the nature and constituents of the waste produced must be submitted in writing to the Regional Board's Executive Officer for review and approval before the proposed change in operations or modification of the designated area is implemented.
7. Any substantial increase or change in the annual average volume of material to be discharged under this order at the Facility must be submitted in writing to the Regional Board's Executive Officer for review and approval.
8. If any portions of the evaporation ponds are to be closed, the Discharger shall notify the Regional Board's Executive Officer at least 180 days prior to beginning any partial or final closure activities.
9. Fluids and/or materials discharged to and/or contained in the evaporation ponds shall not overflow the ponds.

10. Prior to the use of new chemicals for the purposes of adjustment or control of microbes, pH, scale, and corrosion of the cooling tower water and wastewater, the Discharger shall notify the Regional Board's Executive Officer in writing.
11. For the liquids in the evaporation ponds, a minimum freeboard of two (2) feet shall be maintained at all times.
12. Final disposal of residual waste from cleanup of the evaporation ponds shall be accomplished to the satisfaction of the Regional Board's Executive Officer upon abandonment or closure of operations.
13. The evaporation ponds shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods having a predicted frequency of once in 100 years.
14. Prior to removal of solid material that has accumulated in the evaporation ponds, an analysis of the material must be conducted and the material must be disposed of in a manner consistent with that analysis and applicable laws and regulations.
15. Conveyance systems throughout the Facility area shall be cleaned out at least every 90 days to prevent the buildup of solids.
16. Pipe maintenance and de-scaling activities that include hydroblasting and/or sandblasting shall be performed within a designated area that minimizes the potential for release to the environment. Waste generated as a result of these activities shall be disposed of in accordance with applicable laws and regulations. Water from the hydroblasting process shall be conveyed to the evaporation ponds.
17. Public contact with wastewater shall be precluded through such means as fences, signs, or other acceptable alternatives.
18. The evaporations ponds shall be managed and maintained to ensure their effectiveness, in particular,
19. Implementation of erosion control measures shall assure that small coves and irregularities are not created.
20. The liner beneath the evaporation ponds shall be appropriately maintained to ensure its proper functioning.
21. Solid material shall be removed from the evaporation ponds in a manner that minimizes the likelihood of damage to the liner.

22. Ninety (90) days prior to the cessation of discharge operations at the Facility, the Discharger shall submit a workplan, subject to approval of the Regional Board's Executive Officer, for assessing the extent, if any, of contamination of natural geological materials and waters of the Chuckwalla Valley Groundwater Basin by the waste. One hundred twenty (120) days following workplan approval, the Discharger shall submit a technical report presenting results of the contamination assessment. A California Registered Civil Engineer or Certified Engineering Geologist must prepare the workplan, contamination assessment, and engineering report.
23. Upon ceasing operation at the Facility, all waste, all natural geologic material contaminated by waste, and all surplus or unprocessed material shall be removed from the site and disposed of in accordance with applicable laws and regulations.
24. The Discharger shall establish an irrevocable bond for closure in an amount acceptable to the Regional Board's Executive Officer or provide other means to ensure financial security for closure if closure is needed at the discharging site. The closure fund shall be established (or evidence of an existing closure fund shall be provided) within six (6) months of the adoption of this Order.
25. Surface drainage from tributary areas or subsurface sources, shall not contact or percolate through the waste discharged at this site.
26. The Discharger shall implement the attached Monitoring and Reporting Program, Appendix D, and revisions thereto, in order to detect, at the earliest opportunity, any unauthorized discharge of waste constituents from the Facility, or any impairment of beneficial uses associated with (caused by) discharges of waste to the brine pond.
27. The Discharger shall use the constituents listed in the attached Monitoring and Reporting Program, Appendix D, and revisions thereto, as "Monitoring Parameters".
28. The Discharger shall follow the Water Quality Protection Standard (WQPS) for detection monitoring established by the Regional Board. The following are parts of WQPS as established by the Regional Board's Executive Officer:
  - a. The Discharger shall test for the monitoring parameters and the Constituents of Concern (COCs) listed in the Monitoring and Reporting R7-2010-0xxx and revisions thereto.

- b. Concentration Limits – The concentration limit for each monitoring parameter and constituents of concern for each monitoring point (as stated in the Detection Monitoring Program), shall be its statically determined background value or method detection limit, whichever is higher as obtained during that reporting period.
29. All current, revised, and/or proposed monitoring points must be approved by the Region Board’s Executive Officer.
  30. Water used for the process and site maintenance shall be limited to the amount necessary in the process, for dust control, and for Facility cleanup and maintenance.
  31. The Discharger shall not cause or permit the release of pollutants, or waste constituents, in a manner which could cause or contribute to a condition of contamination, nuisance, or pollution to occur.
  32. The Discharger must develop and implement a Hazardous Materials Business Plan (HMBP), which will include, at a minimum, procedures for:
    - a. Hazardous materials handling, use, and storage;
    - b. Emergency response;
    - c. Spill control and prevention;
    - d. Employee training; and
    - e. Reporting and record keeping.
  33. Hazardous materials expected to be used during construction include: unleaded gasoline, diesel fuel, oil, lubricants (i.e., motor oil, transmission fluid, and hydraulic fluid), solvents, adhesives, and paint materials. There are no feasible alternatives to these materials for construction or operation of construction vehicles and equipment, or for painting and caulking buildings and equipment.
  34. The construction contractor will be responsible for assuring that the use, storage and handling of these materials will comply with applicable federal, state, and local laws, ordinances, regulations and standards (LORS), including licensing, personnel training, accumulation limits, reporting requirements, and recordkeeping.
  35. During Facility operations, chemicals will be stored in chemical storage areas appropriately designed for their individual characteristics. Bulk chemicals will be stored outdoors on impervious surfaces in aboveground storage tanks with secondary containment. Secondary containment areas

for bulk storage tanks will not have drains. Any chemical spills in these areas will be removed with portable equipment and reused or disposed of properly. Other chemicals will be stored and used in their delivery containers.

36. A portable storage trailer may be on-site for storage of maintenance lube oils, chemicals, paints, and other construction materials, as needed. All drains and vent piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious vapors. The storage, containment, handling, and use of these chemicals will be managed in accordance with applicable laws, ordinances, regulations, and standards.
37. Small quantities of hazardous wastes will be generated over the course of construction. These may include paint, spent solvents, and spent welding materials. Some hazardous wastes will be recycled, including used oils from equipment maintenance, and oil-contaminated materials such as spent oil filters, rags, or other cleanup materials. Used oil must be recycled, and oil or heavy metal contaminated materials (e.g., filters) requiring disposal must be disposed of in a Class I waste disposal facility. Scale from pipe and equipment cleaning operations, and solids from the evaporation pond, will be disposed of in a similar manner.
38. All hazardous wastes generated during facility construction and operation must be handled and disposed of in accordance with applicable laws, ordinances, regulations, and standards. Any hazardous wastes generated during construction must be collected in hazardous waste accumulation containers near the point of generation and moved daily to the contractor's 90-day hazardous waste storage area located on-site. The accumulated waste must subsequently be delivered to an authorized waste management facility. Hazardous wastes must be either recycled or managed and disposed of properly in a licensed Class I waste disposal facility authorized to accept the waste.
39. The Discharger shall monitor the evaporation ponds in conformance with applicable CCR Title 27 requirements for Class II surface impoundment waste management units.
40. The leachate collection and removal system must be used to provide preliminary detection monitoring of leaks through the top liner of the doublelined evaporation ponds. Physical evidence of leachate beneath the upper concrete liner shall be interpreted as a warning that containment of the evaporation pond contents may be compromised.

41. Groundwater monitoring wells must be constructed adjacent to and both up gradient and down gradient of the evaporation ponds to provide background and detection monitoring for any potential release from the evaporation ponds containment. The Point of Compliance to be used for the detection monitoring must be the uppermost groundwater beneath the evaporation pond. The groundwater monitoring wells must be constructed in conformance with Title 27 CCR Section 20415 requirements. The monitoring wells must be designed to meet the background and detection monitoring requirements in conformance with Title 27 CCR Section 20415(b)(1)(B) as applicable, including:
  - a. Providing a sufficient number of monitoring points to yield ground water samples from the uppermost aquifer that represent the quality of ground water passing the Point of Compliance and to allow for the detection of a release from the evaporation ponds;
  - b. Providing a sufficient number of monitoring points and background monitoring points installed at appropriate locations and depths to yield ground water samples from the uppermost aquifer to provide the best assurance of the earliest possible detection of a release from the evaporation ponds; and
  - c. Selecting monitoring point locations and depths that include the zone(s) of highest hydraulic conductivity in the ground water body monitored.
42. The detection monitoring wells shall be constructed to meet the well performance standards set forth in Title 27 CCR Section 20415(b)(4), as applicable, including:
43. All monitoring wells shall be cased and constructed in a manner that maintains the integrity of the monitoring well bore hole and prevents the bore hole from acting as a conduit for contaminant transport.
44. The sampling interval of each monitoring well shall be appropriately screened and fitted with an appropriate filter pack to enable collection of representative ground water samples.
45. For each monitoring well, the annular space (i.e., the space between the bore hole and well casing) above and below the sampling interval shall be appropriately sealed to prevent entry of contaminants from the ground surface, entry of contaminants from the unsaturated zone, cross contamination between portions of the zone of saturation, and contamination of samples.

46. All monitoring wells shall be adequately developed to enable collection of representative ground water samples.
47. The monitoring program must also meet the general requirements set forth in Title 27 CCR Section 20415(e), which require that all monitoring systems be designed and certified by a registered geologist or a registered civil engineer. The applicable general requirements set forth for boring logs, quality assurance/quality control, sampling and analytical methods used, background sampling, data analysis, and other reporting as applicable will be implemented.
48. Baseline samples of the groundwater must be collected from each of the monitoring wells and analyzed prior to discharging wastewater to the evaporation ponds. The groundwater must be initially sampled for each of the proposed monitoring parameters listed in the attached Monitoring and Reporting Program, Appendix D, and any additional Constituents of Concern (COC) identified by the Regional Board.

## **B. Prohibitions**

1. The discharge or deposit of solid waste to the evaporation ponds as a final form of disposal is prohibited, unless authorized by the Regional Board's Executive Officer.
2. The Discharger is prohibited from discharging, treating or composting at this site the following wastes:
  - a. Municipal solid waste;
  - b. Sludge (including sewage sludge, water treatment sludge, and industrial sludge);
  - c. Septage;
  - d. Liquid waste, unless specifically allowed by these WDRs or approved by the Regional Board's Executive Officer;
  - e. Oily and greasy liquid waste; unless specifically allowed by these WDRs or approved by the Regional Board's Executive Officer;
  - f. Hot, burning waste materials or ash.
1. The Discharger shall not cause degradation of any groundwater aquifer or water supply.
2. The discharge of waste to land not owned or controlled by the Discharger is prohibited.

3. Use of wastewater or cooling tower liquids on access roads, well pads, or other developed project locations for dust control is prohibited.
4. The discharge of hazardous or designated wastes to other than a waste management unit authorized to receive such waste is prohibited.
5. Any hazardous waste generated or stored at the facility will be contained and disposed in a manner that complies with federal and state regulations.
6. Wastewater or any fluids in the evaporation ponds shall not enter any canal, drainage, or drains (including subsurface drainage systems) which could provide flow to the Waters of the State.
7. The Discharger shall appropriately dispose of any materials, including fluids and sediments removed from the evaporation ponds.
8. The Discharger shall neither cause nor contribute to the contamination or pollution of ground water via the release of waste constituents in either liquid or gaseous phase.
9. Direct or indirect discharge of any waste to any surface water or surface drainage courses is prohibited.
10. The Discharger shall not cause the concentration of any Constituent of Concern or Monitoring Parameter to exceed its respective background value in any monitored medium at any Monitoring Point assigned for Detection Monitoring pursuant to the attached Monitoring and Reporting, Appendix D, and future revisions thereto.

**C. Provisions**

1. The Discharger shall comply with the attached Monitoring and Reporting Program, Appendix D, and future revisions thereto, as specified by the Regional Board's Executive Officer.
2. Unless otherwise approved by Regional Board's Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health. All analyses shall be conducted in accordance with the latest edition of "Guideline Establishing Test Procedures for Analysis of Pollutants", promulgated by the United States Environmental Protection Agency.
3. The laboratory shall use detection limits less than or equal to Environmental Protection Agency (EPA) Action Level/Maximum Contaminate Levels (MCLs) or California Department of Public Health (CDPH) Notification Level/MCL for all samples analyzed. The lowest

concentration, whether EPA or CDPH, of the two agencies must be used for the analysis.

4. Prior to any change in ownership of this operation, the Discharger shall transmit a copy of the Board Order to the succeeding owner/operator, and forward a copy of the transmittal letter to the Regional Board.
5. Prior to any modification in this facility that would result in material change in the quality or quantity of discharge, or any material change in the location of discharge, the Discharger shall report all pertinent information in writing to the Regional Board's Executive Officer and obtain revised waste discharge requirements before any modification is implemented.
6. All permanent containment structures and erosion and drainage control systems shall be certified by a California Registered Civil Engineer or Certified Engineering Geologist as meeting the prescriptive standards and performance goals.
7. The Discharger shall ensure that all site-operating personnel are familiar with the content of these WDRs, and shall maintain a copy of these WDRs at the site.
8. These WDRs do not authorize violation of any federal, state, or local laws or regulations.
9. The Discharger shall allow the Regional Board, or an authorized representative, upon presentation of credential and other documents as may be required by law, to:
  - a. Enter upon the premises regulated by these WDRs, or the place where records must be kept under the conditions of these WDRs;
  - b. Have access to and copy, at reasonable times, any records that shall be kept under the condition of these WDRs;
  - c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under these WDRs; and
  - d. Sample or monitor at reasonable times, for the purpose of assuring compliance with these WDRs or as otherwise authorized by the CWC or California Code of Regulations, any substances or parameters at this location.

1. The Discharger shall comply with all of the conditions of these WDRs. Any noncompliance with these WDRs constitutes a violation of the Porter-Cologne Water Quality Act and may be grounds for enforcement action.
2. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with these WDRs. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures.
3. These WDRs do not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.
4. The Discharger shall comply with the following:
  - a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
  - b. The Discharger shall retain records of all monitoring information, copies of all reports required by these WDRs, and records of all data used to complete the application for these WDRs, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Board's Executive Officer at any time.
  - c. Records of monitoring information shall include:
    - i. The date, exact places, and time of sampling or measurements.
    - ii. The individual(s) who performed the sampling or measurements.
    - iii. The date(s) analyses were performed.
    - iv. The individual(s) responsible for reviewing the analyses.
    - v. The results of such analyses.
  - d. Monitoring must be conducted according to test procedures described in the attached Monitoring and Reporting Program, Appendix D, unless other test procedures have been specified in these WDRs or approved by the Regional Board's Executive Officer.

1. All monitoring systems shall be readily accessible for sampling and inspection.
2. The Discharger is the responsible party for the WDRs, and the monitoring and reporting program for the Facility. The Discharger shall comply with all conditions of these WDRs. Violations may result in enforcement actions, requiring corrective action or imposing civil monetary liability.
3. The Discharger shall furnish, under penalty of perjury, technical monitoring program reports, and such reports shall be submitted in accordance with the specifications prepared by the Regional Board's Executive Officer. Such specifications are subject to periodic revisions as may be warranted.
4. The Discharger may be required to submit technical reports as directed by the Regional Board's Executive Officer.
5. The procedure for preparing samples for the analyses shall be consistent with the attached Monitoring and Reporting Program, Appendix D, and any future revisions thereto. The Monitoring Reports shall be certified to be true and correct, and signed, under penalty of perjury, by an authorized official of the company. All technical reports require the signature of a California Registered Professional Engineer or Professional Geologist.
6. All monitoring shall be done as described in Title 27 of the CCRs.

## SOIL AND WATER RESOURCES – APPENDIX D

### MONITORING AND REPORTING PROGRAM FOR WASTEWATER DISCHARGE - PALEN SOLAR HOLDINGS, LLC,

Owner/Operator, Palen Solar Electric Generating System, Riverside County

#### PART I – GENERAL REQUIREMENTS

##### A. GENERAL

A Discharger who owns or operates a Class II Surface Impoundment is required to comply with the provisions of Title 27, Division 2, Chapter 3, Subchapter 3, Article 1 of the California Code of Regulations for the purpose of detecting, characterizing, and responding to releases to the groundwater. Section 13267, California Water Code (CWC) gives the Colorado River Basin Regional Water Quality Control Board (Regional Board) authority to require monitoring program reports for discharges that could affect the quality of waters within its region.

1. This Monitoring and Reporting Program (MRP) is Appendix D of the WDRs set forth in Appendices B and C, and are incorporated herein by this reference. The principal purpose of this self-monitoring program is:
  - a. To document compliance with Waste Discharge Requirements (WDRs), and prohibitions established by the Regional Board;
  - b. To facilitate self-policing by the Discharger in the prevention and abatement of pollution arising from waste discharge;
  - c. To conduct water quality analyses.
2. The Regional Board Executive Officer may alter the monitoring parameters, monitoring locations, and/or the monitoring frequency during the course of this monitoring program.

##### B. DEFINITION OF TERMS

1. Affected Persons – all persons who either own or occupy land outside the boundaries of the parcel upon which a waste management unit (surface impoundment or impoundment) is located that has been or may be affected by the release of waste constituents from the unit.
2. Background Monitoring Point – a device (e.g. well) or location (e.g. a specific point along a lakeshore) that is up gradient or side gradient from the impoundment assigned by this MRP, where water quality samples are taken that

are not affected by a release from the impoundment and that are used as a basis of comparison against samples taken from down gradient Monitoring Points.

3. Constituents of Concern (COCs) – those constituents likely to be in the waste, or derived from waste constituents in the event of a release from the impoundment.
4. Matrix Effect – refers to any change in the Method Detection Limit (MDL) or Practical Quantitation Limit (PQL) for a given constituent as a result of the presence of other constituents - either of natural origin or introduced through a spill or release - that are present in the sample being analyzed.
5. Method Detection Limit (MDL) – the lowest constituent concentration that can support a non-zero analytical result with 99 percent reliability. The MDL is laboratory specific and should reflect the detection capabilities of specific procedures and equipment used by the laboratory.
6. Monitored Media – water - bearing media monitored pursuant to this Monitoring and Reporting Program. The Monitored Media may include: (1) groundwater in the uppermost aquifer, in any other portion of the zone of saturation (as defined in Title 27, Section 20164) in which it would be reasonable to anticipate that waste constituents migrating from the surface impoundment could be detected, and in any perched zones underlying the impoundment, (2) any bodies of surface water that could be measurably affected by a release, (3) soil-pore liquid beneath and/or adjacent to the surface impoundment, and (4) soil-pore gas beneath and/or adjacent to the surface impoundment.
7. Monitoring Parameters – the list of constituents and parameters used for the majority of monitoring activity.
8. Monitoring Point – a device (e.g. well) or location (e.g. a specific point along a lakeshore) that is down gradient from the surface impoundment assigned by this MRP, at which samples are collected for the purpose of detecting a release by comparison with samples collected at Background Monitoring Points.
9. Practical Quantification Limit (PQL) – the lowest constituent concentration at which a numerical concentration can be assigned with a 99 percent certainty that its value is within 10 percent of the actual concentration in the sample. The PQL is laboratory specific and should reflect the detection capabilities of specific procedures and equipment used by the laboratory.
10. Reporting Period – the duration separating the submittal of a given type of monitoring report from the time the next iteration of that report is scheduled for submittal. Unless otherwise stated, the due date for any given report shall be 30 days after the end of its Reporting Period.
11. Sample Locations -

- a. For Monitoring Points – the number of data points obtained from a given Monitoring Point during a given Reporting Period – used for carrying out the statistical or non-statistical analysis of a given analyte during a given Reporting Period.
  - b. For Background Monitoring Points – the number of new and existing data points from all applicable Background Monitoring Points in a given Monitored Medium – used to collectively represent the background concentration and variability of a given analyte in carrying out a statistical or non-statistical analysis of that analyte during a given Reporting Period.
12. Uppermost Aquifer – the geologic formation nearest the natural ground surface that is an aquifer, as well as, lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary.
  13. Volatile Organic Constituents (VOCs) – the suite of organic constituents having a high vapor pressure. The term includes at least the 47 organic constituents listed in Appendix I to 40 CFR Part 258.
  14. VOC<sub>water</sub> – the composite monitoring parameter that includes all VOCs that are detectable in less than 10 percent of the applicable background samples. This parameter is analyzed using the non-statistical method described in Part III.A.2 of this MRP, to identify releases of VOCs that are detected too infrequently in background water to allow for statistical analysis.

### **C. SAMPLING AND ANALYTICAL METHODS**

Sample collection, storage, and analysis shall be performed according to the most recent version of Standard USEPA methods, and California ELAP rulings. Water and waste analysis shall be performed by a laboratory approved for these analyses by the California Department of Public Health. Specific methods of analysis must be identified. If methods other than USEPA-approved methods or Standard Methods are used, the exact methodology must be submitted for review and approval by the Regional Board Executive Officer prior to use. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurement. In addition, the Discharger is responsible for verifying that laboratory analysis of all samples from Monitoring Points and Background Monitoring Points meet the following restrictions:

1. Methods, analysis, and detection limits used must be appropriate for expected concentrations. For detection monitoring of any constituent or parameter found in concentrations that produce more than 90% non-numerical determinations (i.e. "trace" or "ND") in data from Background Monitoring Points for that medium, the

analytical methods having the lowest "facility-specific method detection limit (MDL)", defined in Part I.B.5., shall be selected from among those methods that provide valid results in light of any "Matrix Effects" (defined in Part I.B.4.) involved.

2. Analytical results falling between the MDL and the PQL shall be reported as "trace", and shall be accompanied both by the estimated MDL and PQL values for that analytical run, and by an estimate of the constituent's concentration.
3. MDLs and PQLs shall be derived by the laboratory for each analytical procedure, according to State of California laboratory accreditation procedures. These MDLs and PQLs shall reflect the detection and quantitation capabilities of the specific equipment used by the lab. If the lab suspects that, due to a change in matrix or other effects, the true detection limit or quantitation limit for a particular analytical run differs significantly from the laboratory-derived MDL/PQL values, the results shall be flagged accordingly, along with an estimate of the detection limit and quantitation limit actually achieved.
4. All Quality Assurance/Quality Control (QA/QC) data shall be reported, along with the sample results to which it applies, including the method, equipment, and analytical detection limits, the recovery rates, an explanation of any recovery rate that is less than method recovery standards, the results of equipment and method blanks, the results of spiked and surrogate samples, the frequency of quality control analysis, and the name and qualifications of the person(s) performing the analyses. Sample results shall be reported unadjusted for blank results or spike recovery.
5. Upon receiving written approval from the Regional Board Executive Officer, an alternative statistical or non-statistical procedure can be used for determining the significance of analytical results for a constituent that is a common laboratory contaminant (i.e., methylene chloride, acetone, diethylhexyl phthalate, and di-n-octyl phthalate) during any given Reporting Period in which QA/QC samples show evidence of laboratory contamination for that constituent. Nevertheless, analytical results involving detection of these analytes in any background or down gradient sample shall be reported and flagged for easy reference by Regional Board staff.
6. In cases where contaminants are detected in QA/QC samples (i.e. field, trip, or lab blanks), the accompanying sample results shall be appropriately flagged.
7. The MDL shall always be calculated such that it represents a concentration associated with a 99% reliability of a non-zero result.

#### **D. RECORDS TO BE MAINTAINED**

Written reports shall be maintained by the Discharger or laboratory, and shall be retained for a minimum of five (5) years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board. Such records shall show the following for each sample:

1. Identity of sample and of the Monitoring Point or Background Monitoring Point from which it was taken, along with the identity of the individual who obtained the sample;
2. Date and time of sampling;
3. Date and time that analyses were started and completed, and the initials of the personnel performing each analysis;
4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
5. Calculations of results; and
6. Results of analyses, and the MDL and PQL for each analysis.

#### **E. REPORTS TO BE FILED WITH THE REGIONAL BOARD**

1. Detection Monitoring Reports – For each Monitored Medium, all Monitoring Points and Background Monitoring Points assigned to detection monitoring under Part II.A.7 of this MRP shall be monitored **semiannually** for the Monitoring Parameters (Part II.A.4). A “Detection Monitoring Report” shall be submitted to the Regional Board in accordance with the schedule contained in the Summary of Self-Monitoring and Reporting Requirements, and shall include the following:

- a. A Letter of Transmittal that summarizes the essential points in each report shall accompany each report submittal. The letter of transmittal shall be signed by a principal executive officer at the level of vice-president or above, or by his/her duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter of transmittal shall include:
  - i. A discussion of any violations noted since the previous report submittal and a description of the actions taken or planned for correcting those violations. If no violations have occurred since the last submittal, that should be so stated;
  - ii. If the Discharger has previously submitted a detailed time schedule or plan for correcting any violations, a progress report on the time schedule and status of the corrective actions being taken; and

- iii. A statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.
- b. A Compliance Evaluation Summary shall be included in each Detection Monitoring Report. The compliance evaluation summary shall contain at least:
  - i. Velocity and direction of groundwater flow for each monitored groundwater body under and around the surface impoundment based upon the water level elevations taken during the collection of water quality data. A description and graphical presentation (e.g., arrow on a map) shall be submitted;
  - ii. Methods used for water level measurement and pre-sampling purging for each monitoring well addressed by the report including:
    - 1. Method, time, and equipment used for water level measurement;
    - 2. Type of pump used for purging, placement of the pump in the well, pumping rate, and well recovery rate;
    - 3. Methods and results of field testing for pH, temperature, electrical conductivity, and turbidity, including:
      - a. Equipment calibration methods, and
      - b. Method for disposing of purge water
  - iii. Methods used for sampling each Monitoring Point and Background Monitoring Point, including:
    - 1. A description of the type of pump, or other device used, and its placement for sampling;
    - 2. A detailed description of the sampling procedure: number and description of samples, field blanks, travel blanks, and duplicate samples; types of containers and preservatives used; date and time of sampling; name and qualifications of individual collecting samples, and other relevant observations;
- c. A map or aerial photograph showing the locations of Monitoring Points, and Background Monitoring Points;
- d. For each Detection Monitoring Report, provide all relevant laboratory information including results of all analyses, and other information needed to demonstrate compliance with Part I.C.;
- e. An evaluation of the effectiveness of the run-off/run-on control facilities;

- f. A summary of reportable spills/leaks occurring during the reporting period; include estimated volume of liquids/solids discharged outside designated containment area, a description of management practices to address spills/leaks, and actions taken to prevent reoccurrence.
2. Annual Summary Report – The Discharger shall submit to the Regional Board, an “Annual Summary Report” for the period extending from January 1 through December 31. The “Annual Summary Report” is due **March 15** of each year, and shall include the following:
    - a. A graphical presentation of analytical data for each Monitoring Point and Background Monitoring Point (Title 27, Section 20415(e)(14)). The Discharger shall submit, in graphical format, the laboratory analytical data for all samples taken within at least the previous five (5) calendar years. Each such graph shall plot the concentration of one (1) or more constituents over time for a given Monitoring Point and Background Monitoring Point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot down gradient data. On the basis of any aberrations noted in the plotted data, the Regional Board Executive Officer may direct the Discharger to carry out a preliminary investigation (Title 27, Section 20080(d)(2)), the results of which will determine whether or not a release is indicated;
    - b. A tabular presentation of all monitoring analytical data obtained during the previous two (2) Monitoring and Reporting Periods, submitted on hard copy within the annual report as well as digitally on electronic media in a file format acceptable to the Regional Board Executive Officer (Title 27, Section 20420(h)). The Regional Board regards the submittal of data in hard copy and on diskette CD-ROM as "...a form necessary for..." statistical analysis in that this facilitates periodic review by the Regional Board statistical consultant;
    - c. A comprehensive discussion of the compliance record and any corrective actions taken or planned, which may be needed to bring the Discharger into full compliance with WDRs;
    - d. A written summary of the groundwater analyses, indicating changes made since the previous annual report; and
    - e. An evaluation of the effectiveness of the run on/run-off control facilities, pursuant to Title 27, Section 20365.

3. Contingency Reporting

- a. The Discharger shall report any spill of evaporation pond liquid by telephone within 48 hours of discovery. The reportable quantity for evaporation pond liquid is 150 gallons.

After reporting a spill, a written report shall be filed with the Regional Board Executive Officer within seven (7) days, containing at a minimum the following:

- i. A map showing the location(s) of the discharge/spill;
  - ii. A description of the nature of the discharge (all pertinent observations and analyses including quantity, duration, etc.); and
  - iii. Corrective measures underway or proposed.
- b. Should the initial statistical comparison (Part III.A.1.) or non-statistical comparison (Part III.A.2.) indicate, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified, the Discharger shall immediately notify the Regional Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within seven (7) days of such determination (Title 27, Section 20420(j)(1)), and shall conduct a discrete retest in accordance with Part III.A.3. If the retest confirms the existence of a release, the Discharger shall carry out the requirements of Part I.E.3.d. In any case, the Discharger shall inform the Regional Board of the outcome of the retest as soon as the results are available, following up with written results submitted by certified mail within seven (7) days of completing the retest.
- c. If either the Discharger or the Regional Board determines that there is significant physical evidence of a release (Title 27, Section 20385(a)(3)), the Discharger shall immediately notify the Regional Board of this fact by certified mail (or acknowledge the Regional Board's determination) and shall carry out the requirements of Part I.E.3.d. for all potentially-affected monitored media.
- d. If the Discharger concludes that a release has been discovered:
- i. If this conclusion is not based upon "direct monitoring" of the Constituents of Concern, pursuant to Part II.A.5., then the Discharger shall, within thirty days, sample for all Constituents of Concern at all Monitoring Points and submit them for laboratory analysis. Within seven (7) days of receiving the laboratory analytical results, the Discharger shall notify the Regional Board, by certified mail, of the concentration of

all Constituents of Concern at each Monitoring Point. Because this scan is not to be tested against background, only a single datum is required for each Constituent of Concern at each Monitoring Point [Title 27 Section 20420(k)(1)];

- ii. The Discharger shall, within 90 days of discovering the release (Title 27, Section 20420(k)(5)), submit a Revised Report of Waste Discharge proposing an Evaluation Monitoring Program meeting the requirements of Title 27, Section 20425; and
  - iii. The Discharger shall, within 180 days of discovering the release (Title 27, Section 20420(k)(6)), submit a preliminary engineering feasibility study meeting the requirements of Title 27, Section 20430.
- e. Any time the Discharger concludes - or the Regional Board Executive Officer directs the Discharger to conclude - that a liquid phase release from the surface impoundment has proceeded beyond the facility boundary, the Discharger shall so notify all persons who either own or reside upon the land that directly overlies any part of the plume (Affected Persons).
- i. Initial notification to Affected Persons shall be accomplished within 14 days of making this conclusion and shall include a description of the Discharger's current knowledge of the nature and extent of the release; and
  - ii. Subsequent to initial notification, the Discharger shall provide updates to all Affected Persons, including any persons newly affected by a change in the boundary of the release, within 14 days of concluding a material change in the nature or extent of the release has occurred.

#### 4. Surface Impoundment - Leakage Detection System (LDS), and Solids Monitoring

- a. Sampling and reporting shall be conducted semi-annually.
- b. Provide volume of solids removed from the holding pond each month for that reporting period, and transported to a waste management facility for disposal. Include name and location of waste management facility.
- c. Conduct quarterly inspections of Leakage Detection System (LDS), and holding pond.

## **PART II – MONITORING REQUIREMENTS FOR GROUNDWATER**

### **A. GROUNDWATER SAMPLING AND ANALYSIS FOR DETECTION MONITORING**

1. Groundwater Surface Elevation and Field Parameters – Groundwater sampling and analysis shall be conducted semiannually pursuant to California ELAP rulings, and include an accurate determination of the groundwater surface elevation and field parameters (temperature, electrical conductivity, turbidity) for each Monitoring Point and Background Monitoring Point (Title 27, Section 20415(e)(13)). Groundwater elevation obtained prior to purging the well and sample collection, shall be used to fulfill the semi-annual groundwater flow rate/direction analyses required under Part I.E.1.b.i. Groundwater wells shall be gauged using an electronic sounder capable of measuring depth to groundwater within 100<sup>th</sup> of an inch. Following gauging, wells shall be purged according to EPA groundwater sampling procedures until:
  - a. pH, temperature, and conductivity are stabilized within 10 percent, and
  - b. turbidity has been reduced to 10 NTUs or the lowest practical levels achievable.

The above identified parameters shall be recorded in the field, and submitted in the monitoring report. Sampling equipment shall be decontaminated between wells. Purge water may be discharged to the brine pond; discharge to the ground surface is prohibited.

2. Groundwater Sample Collection - Groundwater samples shall be collected from all monitoring points and background monitoring points after wells recharge to within at least 80 percent of their original static water level. Groundwater samples shall be collected with a peristaltic pump that is decontaminated between sampling events. Samples shall be labeled, logged on chain-of-custody forms, and placed in cold storage pending delivery to a State certified analytical laboratory.
3. Five-Day Sample Procurement Limitation – To satisfy data analysis requirements for a given reporting period, samples collected from all Monitoring Points and Background Monitoring Points shall be taken within a span not exceeding five (5) days, and shall be taken in a manner that insures sample independence to the greatest extent feasible (Title 27, Section 20415(e)(12)(B)).
4. Groundwater Monitoring Parameters for Detection Monitoring – Groundwater samples collected from monitoring points and background monitoring points shall be analyzed for the following:

<u>Parameter</u>	<u>Unit</u>	<u>Sample Type</u>
Chloride	mg/L	Grab
Sulfate	mg/L	Grab
Total Dissolved Solids (TDS)	mg/L	Grab
pH	#	Grab
Specific Conductance	μohms/cm	Grab
Heavy Metals (Sb, As, Ba, Cd, Ca, Cr, Co, Cu, Pb, Hg, Ni, Se, Zn)	mg/L	Grab
Oil & Grease	mg/L	Grab

All Monitoring Points and Background Monitoring Points assigned to Detection Monitoring shall be sampled semi-annually in **June** and **December** of each year in accordance with Part I of this MRP. Monitoring results shall be reported in the semi-annual Detection Monitoring Report.

5. Data Analysis – Statistical or non-statistical analysis shall be carried out as soon as the data is available, in accordance with Part III of this monitoring program.

Monitoring Points and Background Monitoring Points – At a minimum of 90 days prior to the operation of the facility, the Discharger shall submit a proposed groundwater monitoring program, including background and detection monitoring locations, to the Executive Officer for review and approval.

6. Initial Background Determination: For the purpose of establishing an initial pool of background data for each Constituent of Concern at each Background Monitoring Point [Title 27, Section 20415(e)(6)]:
  - a. Whenever a new Constituent of Concern is added to the Water Quality Protection Standard, including any added by the adoption of this Board Order, the Discharger shall collect at least one (1) sample **quarterly** for at least one (1) year from each Background Monitoring Point in each monitored medium and analyze for the newly-added constituent(s); and
  - b. Whenever a new Background Monitoring Point is added, including any added by this Board Order, the Discharger shall sample the new monitoring point at least **quarterly** for at least one (1) year, analyzing for all Constituents of Concern and Monitoring Parameters.

7. Semiannual Determination of Groundwater Flow Rate/Direction (Title 27, Section 20415(e)(15)): The Discharger shall measure the water level in each well and determine groundwater flow rate and direction in each groundwater body described in Part II.A.1. at least semiannually. This information shall be included in the semi-annual Detection Monitoring Reports required under Part I.E.1.

## **PART III – STATISTICAL AND NON-STATISTICAL ANALYSES**

### **A. STATISTICAL AND NON-STATISTICAL ANALYSIS**

The Discharger shall use the most appropriate of the following methods to compare the down gradient concentration of each monitored constituent or parameter with its respective background concentration to determine if there has been a release from the surface impoundment. For any given data set, proceed sequentially down the list of statistical analysis methods listed in Part III.A.1., followed by the non-statistical method in Part III.A.2., using the first method for which the data qualifies. If that analysis tentatively indicates the detection of a release, implement the retest procedure under Part III.A.3.

1. Statistical Methods. The Discharger shall use one (1) of the following statistical methods to analyze Constituents of Concern or Monitoring Parameters that exhibit concentrations exceeding their respective MDL in at least ten percent of the background samples taken during that Reporting Period. Each of these statistical methods is more fully described in the Statistical Methods discussion below. Except for pH, which uses a two-tailed approach, the statistical analysis for all constituents and parameters shall be a one-tailed (testing only for statistically significant increase relative to background) approach:
  - a. One-Way Parametric Analysis of Variance (ANOVA) followed by multiple comparisons (Title 27, Section 20415(e)(8)) – This method requires at least four (4) independent samples from each Monitoring Point and Background Monitoring Point during each sampling episode. It shall be used when the background data for the parameter or constituent obtained during a given sampling period, has not more than 15% of the data below PQL. Prior to analysis, replace all 'trace' determinations with a value halfway between the PQL and the MDL values reported for that sample run, and replace all "non-detect" determinations with a value equal to half the MDL value reported for that sample run. The ANOVA shall be carried out at the 95% confidence level. Following the ANOVA, the data from each down gradient Monitoring Point shall be tested at a 99% confidence level against the pooled background data. If these multiple comparisons cause the Null Hypothesis (i.e., that there is no release) to be rejected at any Monitoring Point, the Discharger shall conclude that a release is tentatively indicated from that parameter or constituent; or
  - b. One-Way Non-Parametric ANOVA (Kruskal-Wallis Test), followed by multiple comparisons – This method requires at least nine (9) independent samples from each Monitoring Point and Background Monitoring Point; therefore, the Discharger shall anticipate the need for taking more than four (4) samples per Monitoring Point, based upon past monitoring results. This method shall be used when the pooled background data for the parameter or constituent, obtained within a given sampling period, has not more than 50% of the data below the PQL. The ANOVA shall be carried out at the 95% confidence level.

Following the ANOVA, the data from each down gradient Monitoring Point shall be tested at a 99% confidence level against the pooled background data. If these multiple comparisons cause the Null Hypothesis (i.e., that there is no release) to be rejected at any Monitoring Point, the Discharger shall conclude that a release is tentatively indicated for that parameter or constituent; or

- c. Method of Proportions – This method shall be used if the "combined data set" – the data from a given Monitoring Point in combination with the data from the Background Monitoring Points – has between 50% and 90% of the data below the MDL for the constituent or parameter in question. This method; (1) requires at least nine (9) down gradient data points per Monitoring Point per Reporting Period, (2) requires at least thirty data points in the combined data set, and (3) requires that  $n * P > 5$  (where n is the number of data points in the combined data set and P is the proportion of the combined set that exceeds the MDL); therefore, the Discharger shall anticipate the number of samples required, based upon past monitoring results. The test shall be carried out at the 99% confidence level. If the analysis results in rejection of the Null Hypothesis (i.e., that there is no release), the Discharger shall conclude that a release is tentatively indicated for that constituent or parameter; or
  - d. Other Statistical Methods. – These include methods pursuant to Title 27, Section 20415(e)(8)(c-e).
2. Non-Statistical Method. The Discharger shall use the following non-statistical methods for all constituents that are not amenable to statistical analysis by virtue of having been detected in less than 10% of applicable background samples. A separate variant of this test is used for the VOC<sub>water</sub> Composite Monitoring Parameters. Regardless of the test variant used, the method involves a two-step process: (1) from all constituents to which the test variant applies, compile a list of those constituents which equal or exceed their respective MDL in the down gradient sample from a given Monitoring Point, then (2) evaluate whether the listed constituents meet either of the test variant's two possible triggering conditions. For each Monitoring Point, the list described above shall be compiled based on either the data from a single sample taken during the Monitoring Period for that Monitoring Point, or (where several independent samples have been analyzed for that constituent at a given Monitoring Point) from the sample that contains the largest number of detected constituents. Background shall be represented by the data from all samples taken from the appropriate Background Monitoring Points during that Reporting Period (at least one (1) sample from each Background Monitoring Point). The method shall be implemented as follows:
- a. VOC<sub>water</sub> Composite Monitoring Parameter – For any given Monitoring Point, the VOC<sub>water</sub> Monitoring Parameter is a composite parameter addressing all detectable VOCs including at least all 47 VOCs listed in Appendix I to 40 CFR 258 and all unidentified peaks. The Discharger shall compile a list of each VOC which (1) exceeds its MDL in the Monitoring Point sample (an unidentified

peak is compared to its presumed (MDL), and also (2) exceeds its MDL in less than ten percent of the samples taken during that Reporting Period from that medium's Background Monitoring Points. The Discharger shall conclude that a release is tentatively indicated for the VOC<sub>water</sub> composite Monitoring Parameter if the list either (1) contains two or more constituents, or (2) contains one constituent that exceeds its PQL;

- b. Constituents of Concern: As part of the COC monitoring required under Part 2.A.5 of this MRP, for each Monitoring Point, the Discharger shall compile a list of COCs that exceed their respective MDL at the Monitoring Point, yet do so in less than ten percent of the background samples taken during that Reporting Period. The Discharger shall conclude that a release is tentatively indicated if the list either (1) contains two or more constituents, or (2) contains one constituent that exceeds its PQL.
3. Discrete Retest – In the event that the Discharger concludes that a release has been tentatively indicated (under Parts III.A.1. or III.A.2.), the Discharger shall, within 30 days of that conclusion, collect two (2) new suites of samples for the indicated Constituent(s) of Concern or Monitoring Parameter(s) at each indicated Monitoring Point, collecting at least as many samples per suite as were used for the initial test. Re-sampling of Background Monitoring Points is optional. As soon as the retest data is available, the Discharger shall use the same statistical method or non-statistical comparison separately on each suite of retest data. For any indicated Monitoring Parameter or Constituent of Concern at an affected Monitoring Point, if the test results of either (or both) of the retest data suites confirms the original indication, the Discharger shall conclude that a release has been discovered. All retests shall be carried out only for the Monitoring Point(s) for which a release is tentatively indicated, and only for the Constituent of Concern or Monitoring Parameter that triggered the indication there, as follows:
    - a. If an ANOVA method was used in the initial test, the retest shall involve only a repeat of the multiple comparison procedure, carried out separately on each of the two (2) new suites of samples taken from the indicating Monitoring Point;
    - b. If the Method of Proportions statistical test was used, the retest shall consist of a full repeat of the statistical test for the indicated constituent or parameter, carried out separately on each of the two (2) new sample suites from the indicating Monitoring Point;
    - c. If the non-statistical comparison was used:
      - i. Because the VOC Composite Monitoring parameters (VOC<sub>water</sub>) each address, as a single parameter, an entire family of constituents which are likely to be present in any surface impoundment release, the scope of the laboratory analysis for each retest sample shall include all VOCs detectable in that retest sample. Therefore, a confirming retest for either parameter shall have validated the original indication even if the suite of constituents in

the confirming retest sample(s) differs from that in the sample that initiated the retest;

- ii. Because all Constituents of Concern that are jointly addressed in the non-statistical testing under Part III.A.2. remain as individual Constituents of Concern, the scope of the laboratory analysis for the non-statistical retest samples shall be narrowed to involve only those constituents detected in the sample which initiated the retest.

**SUMMARY OF SELF-MONITORING AND REPORTING REQUIREMENTS**

**A. GROUNDWATER MONITORING**

1. Groundwater monitoring wells shall be sampled/analyzed semi-annually for the following parameters/constituents:

<u>Parameters &amp; Constituent</u>	<u>Unit</u>	<u>Type of Sample</u>	<u>Reporting Frequency</u>
Chloride	mg/L	grab	semiannual
Sulfate	mg/L	grab	semiannual
Total Dissolved Solids (TDS)	mg/L	grab	semiannual
pH	#	field measurement	semiannual
Specific Conductance	μohms/cm	field measurement	semiannual
Heavy Metals (Sb, As, Ba, Cd, Ca, Cr, Co, Cu, Pb, Hg, Ni, Se, Zn)	mg/L	grab	semiannual
Oil & Grease	mg/L	grab	semiannual

2. The collection, preservation, and holding times of all samples shall be in accordance with the U.S. Environmental Protection Agency approved procedures. All analyses shall be conducted by a laboratory certified by the California Department of Public Health to perform the required analyses.

**B. SURFACE IMPOUNDMENT: Leakage Detection System (LDS), and Solids Monitoring**

	<u>Unit</u>	<u>Observation or Sampling Frequency</u>	<u>Reporting Frequency</u>
Estimated volume of solid/liquid in holding pond	ft <sup>3</sup>	monthly	semiannual
Measurement of freeboard	ft	monthly	semiannual
Volume of solids removed and shipped to off-site waste management facility	tons	monthly	semiannual

### C. MONITORING REPORTS AND OBSERVATION SCHEDULE

“Reporting Period” means the duration separating the submittal of a given type of monitoring report from the time the next iteration of that report is scheduled for submittal. An annual report, which is a summary of all the monitoring during the previous year, shall also be submitted to the Regional Board. The submittal dates for Detection Monitoring Reports and the Annual Summary Report are as follows:

1. Detection Monitoring Reports
  - a. 1<sup>st</sup> Semiannual Report (January 1 through June 30) – report due by **August 1**
  - b. 2<sup>nd</sup> Semiannual Report (July 1 through December 31) – report due by **March 1**
2. Annual Summary Report  
January 1 through December 31 – report due **March 15** of the following year.
3. The Detection Monitoring Reports and the Annual Summary Report shall include the following:
  - a. The Discharger shall arrange the data in tabular form so that the specified information is readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the facility is operating in compliance with WDRs.
  - b. Records of monitoring information shall include:
    - i. The date, exact place, and time of sampling or measurement;
    - ii. The individual performing the sampling or measurement;
    - iii. The date the analysis was performed;
    - iv. The initials of the individual performing the analysis;
    - v. The analytical technique or method used; and
    - vi. The result of the analysis.
  - c. Each report shall contain the following statement:

"I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am

aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment for knowing violations."

- d. A duly authorized representative of the Discharger may sign the documents if:
  - i. Authorization is made in writing by the person described in Part I.E.1.a;
  - ii. Authorization specifies an individual or person having responsibility for the overall operation of the regulated disposal system; and
  - iii. Written authorization is submitted to the Regional Board Executive Officer.
  - iv. Monitoring reports shall be certified under penalty of perjury to be true and correct, and shall contain the required information at the frequency designated in this monitoring report. All technical reports require the signature of a California Registered Professional Engineer or Professional Geologist.

## C. CULTURAL RESOURCES

### DESCRIPTION OF MODIFICATIONS

The modified project is called the Palen Solar Electric Generating System (PSEGS). The modifications proposed in the Petition to Amend include replacing the parabolic trough solar collection system and associated heat transfer fluid with BrightSource's solar tower technology. Heliostats, pylon-mounted mirrors guided by a single tracking system, focus the sun's rays on a solar receiver steam generator (SRSG) atop a 750-foot tower near the center of each heliostat field to create steam, which drives a turbine to generate electricity. (Ex. 2001, p. 4.3-1.)

The maximum area of ground disturbance for the amended project is less than the certified Palen Solar Power Plant (PSPP) project. The certified PSPP project alternatives ranged from approximately 4,365 acres for Reconfigured **Alternative No. 2** to 4,330 acres for Reconfigured **Alternative No. 3**. The disturbance area for the PSEGS project has been reduced to approximately 3,794 acres or approximately 571 acres less than PSPP Reconfigured **Alternative No. 2**, and 536 acres less than PSPP Reconfigured **Alternative No. 3**. (Ex. 2001, p. 4.3-11.)

The amendment to the PSEGS project reduces the overall amount of ground disturbance and requires an internal reconfiguration of the project infrastructure. The PSEGS project contains internal roadway and utility corridors for each of the two plants' heliostat fields and power blocks. Both plant sites will be accessible from 20-foot wide paved or hardscape access roads from the entrance of the PSEGS project site to and around both power blocks. The Petitioner indicates that the construction of the PSEGS project will reduce the volume of requisite earthwork by approximately 4.3 million cubic yards because the construction of heliostat fields does not require the grading of expansive level terraces that the PSPP required for its solar trough fields. While the PSPP alternatives included the use of private land (240 acres for Reconfigured **Alternative No. 2** and 40 acres for No. 3), the PSEGS project will not develop private lands. Access to the site will use the same primary access as originally approved. The PSEGS project will continue to interconnect to the regional transmission grid currently under construction as Southern California Edison's Red Bluff Substation. The primary modifications to the PSPP project that have the potential to increase or add to the negative effects of the facility on cultural resources are the two 250-MW plants or units each consisting of a 750-foot tall solar power tower, a power block, and a dedicated and interconnected field of approximately 85,000 heliostats on pedestals. (Ex. 2001, p. 4.3-11.)

The following evidence on cultural resources was received into evidence on October 28, 2013: Exhibits 1003, 1003, 1004, 1005, 1019, 1026, 1040, 1041, 1057, 1059, 1064,

1065, 1066, 1067, 1077, 1081, 1102 - 1115, 2001, 2003, 2004, 2007, 2008, 2010, 4000, and 8000 - 8027. (10/28/13 RT 133:7 – 145:18.) The following evidence on cultural resources was received into evidence on July 29, 2014: Exhibits 1126, 1171, 1172, 2017 through 2020, 8028, 8029, 8039, 8035, and 8036. (7/29/14 RT 261:16 – 264:7.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that with the implementation of the conditions of certification, the project would not cause significant direct or indirect adverse impacts to cultural resources present at the site. However, the decision found that even with the implementation of conditions of certification, PSPP's incremental contribution to cumulative impacts to cultural resources would be cumulatively considerable. The decision found that with implementation of the conditions of certification, the PSPP conformed to all applicable laws, ordinances, regulations, and standards (LORS) relating to cultural resources. Although the decision found significant cumulative impacts to cultural resources, the Commission made an override finding because the benefits of the project outweighed its significant effects on the environment pursuant to Public Resources Code, section 21081 (PSPP Final Decision, CEC-800-2010-011, **CULTURAL RESOURCES**, pp. 5-6; **OVERRIDE FINDINGS**, pp 5-6.)

### **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

#### **The Project Setting**

The record contains a detailed description of the PSEGS setting, which remains unchanged since the certification of the PSPP. The project site is in the southeastern Mojave Desert in the Sonoran section of the Basin and Range geomorphic province. The project site is in the northern Colorado Desert of eastern Riverside County. The Chuckwalla Valley is classified as a long shallow valley system that is actually contiguous with Pinto Valley to the north. (Ex. 2001, pp. 4.3-9 – 4.3-11.)

The record indicates that construction of the PSEGS project would reduce the volume of requisite earthwork by approximately 4.3 million cubic yards because the construction of heliostat fields does not require the grading of expansive level terraces required for solar trough fields. The primary modifications to the approved PSPP project that have the potential to significantly impact cultural resources are the two 750-foot-tall solar power towers and the interconnected field of approximately 85,000 heliostats on pedestals. (Ex. 2001, pp. 4.3-11.)

The record contains a detailed explanation of the environmental setting including the geology, paleoclimate, and paleoenvironment from the Early Holocene (10,000 – 6,000 BC), through the Middle Holocene (6000-3500 BC) and the Early Late Holocene (3500 BC–AD 1), to the Late Holocene (AD 1–present). (Ex. 2001, pp. 4.3-11 – 4.3-12.)

The description of the PSEGS prehistoric setting, which is unchanged from that of the PSPP, provides the foundational cultural chronology and history scheme used to identify the temporal periods and complexes found in the Colorado Desert. These are the Paleo-Indian Period (about 13,000–8000 BC), the Lake Mojave Complex (8000–6000 BC), the Deadman Lake Complex (7500–5200 BC), the Pinto Complex (8000–3000 BC), the Possible Abandonment (3000–1000 BC), the Gypsum Complex (1000 BC–AD 200), the Rose Spring Complex (AD 200–AD 1000), and the Late Prehistoric Period (AD 1000–AD 1700). (Ex. 2001, pp. 4.3-13 – 4.3-15.)

The evidence describes the Chuckwalla Valley as a resource exploitation zone. It served as an east-west oriented trade route corridor between the Pacific Ocean and the Colorado River/greater Southwest and beyond. An extensive network of trails is present within the Chuckwalla Valley. Given its orientation and location, the valley may have been, at times, a neutral territory unclaimed by neighboring native peoples. At other times, one or several tribes laid claim to all or portions of the valley. Quarry sites probably were “owned” by tribal groups. The distribution of particular types of tool stones may have corresponded to a group’s territorial boundaries, and a tool-stone type may not have occurred beyond the limits of a group’s specific territory. (Ex. 2001, p. 4.3-16.)

Within the Chuckwalla Valley, prehistoric sites are clustered around springs, wells, and other obvious important features or resources. Sites include villages with cemeteries, occupation sites with and without pottery, large and small concentrations of ceramic sherds and flaked stone tools, rock art sites, rock shelters with perishable items, rock rings/stone circles, geoglyphs and cleared areas, a vast network of trails, markers and shrines, and quarry sites. Possible village locations are present at Palen Lake, Granite Well, and Hayfield Canyon. (Ex. 2001, p. 4.3-16.)

A cluster of temporary habitation and special activity (task) sites occurs around a quarry workshop in the Chuckwalla Valley. The Chuckwalla Valley aplite quarry workshop complex probably was used throughout the Holocene. During this period, Chuckwalla Valley most likely was occupied, abandoned, and reoccupied by a succession of ethnic groups. In the Early Holocene (i.e., Lake Mohave complex times), the area may have been relatively densely inhabited. During the Middle Holocene (i.e., Pinto and Gypsum complexes period) it may only have been sporadically visited. The subsequent Late Holocene Rose Spring and Late Prehistoric periods probably witnessed reoccupation of the valley by Yuman and Numic-speaking peoples. (Ex. 2001, p. 4.3-16.)

The record contains a detailed discussion of the research topics used to describe the inhabitants of the Chuckwalla Valley. These research topics include tool stone procurement, ceramic traditions, horticulture, trade and exchange, and cultural landscapes, including trails and geoglyphs. (Ex. 2001, pp. 4.3-17 – 4.3-23.)

Energy Commission staff conducted an ethnographic study to identify Native American concerns and used the study as a basis for determining the significance of related resources and potential mitigation for impacts to those resources that may have their integrity impacted due to the change in the visual nature of the PSEGS project. Staff invited tribes to participate in the ethnographic study based upon a list of 16 affiliated tribes, organizations, and individuals provided by the Native American Heritage Commission and the Bureau of Land Management (BLM). The record describes 18 tribal entities that may have a connection to the PSEGS site. Seven of these entities participated in consultation for the project and/or this study and one tribe, the Colorado River Indian Tribes (CRIT), participated as an Intervenor. The tribes identified and described in the record are Southern Paiute, Chemehuevi Tribe, Twenty-Nine Palms Band of Mission Indians, Mohave Indians, Colorado River Indian Tribes, Fort Mojave Indian Tribe, Quechan Tribe, Cocopah Indian Tribe, Agua Caliente Band of Cahuilla Indians, Augustine Tribe of Cahuilla Indians, Cabazon Band of Mission Indians, Cahuilla Band of Mission Indians, Morongo Band of Mission Indians, Ramona Band of Cahuilla Indians, Soboba Band of Luiseño Indians, Torres-Martinez Desert Cahuilla Indians, Serrano Indians, and the San Manuel Band of Mission Indians. (Ex. 2001, pp. 4.3-24 – 4.3-31.)

Staff's description of the Historic Period remains unchanged from the analysis submitted in the PSPP certification proceedings. It describes the Spanish and Mexican exploration of routes through the desert starting with the Spanish explorer Hernando de Alarcon who first explored the region in 1540, and ending with Jose Maria Romero, a Mexican Army captain who travelled near the Palen site in 1824. (Ex. 2001, p. 4.3-32.)

The first Americans came in 1846 during the opening stages of the Mexican-American war. General Stephen Watts Kearny led an advance column of the United States Army into the region. Only days after the Mexican-American War ended, gold was discovered kicking off the California Gold Rush of 1849. It is estimated that more than 100,000 travelers passed by way of the Yuma Crossing. After 1851, travel to California along the southern route through the Colorado Desert declined. Horse traders and livestock drovers still used the trail to drive herds from Texas and Mexico to California, and the U.S. Army continued to send caravans of provisions from San Diego to its outpost, Fort Yuma, at least until 1852. Anglo-American homesteading and settlement in the Chuckwalla Valley was dependent upon the access to groundwater. The first known documented well was that of Hank Brown about three miles west of the PSEGS project area. In 1909, at the start of the land rush, Brown's well was reportedly 300 feet deep and plainly visible from the road. A couple of years later, a man named Peter S. Gruendike settled in the valley not far west of the PSEGS. Gruendike planted many kinds of trees and had over 300 palms of different kinds. His land was patented in 1916.

Stephen Ragsdale, a cotton farmer from Palo Verde Mesa, acquired Gruendike's property in 1915 and began operating a towing business at the establishment. Six years later, when Route 60 opened a mile or so to the north, he founded the tiny settlement of Desert Center midway between Indio and Blythe. (Ex. 2001, pp. 4.3-32 – 4.3-34.)

In 1915, the Chuckwalla Valley Road was essentially 90 miles of blow sand and cross washes with a couple of ruts. It was not until 1936 that U.S. Highway 60-70 between Indio and Blythe was paved. In 1968 this highway became Interstate 10 (I-10) connecting Los Angeles and Phoenix. Most other roads in the area remained unpaved. (Ex. 2001, p. 4.3-35.)

Although schemes to appropriate Colorado River waters began as early as 1859, the first major canal, the Alamo, was not constructed until 1901. It conveyed water to the Imperial Valley for two years before becoming choked with silt. A temporary measure to bypass the blocked areas resulted in disaster when a spring flood in 1905 diverted the whole river into the Salton Sink, creating the body of water known today as the Salton Sea. (Ex. 2001, p. 4.3-35.)

In the first decade of the twentieth century, farmers in the Coachella Valley west of the PSEGS relied solely upon groundwater from artesian wells, planting extensive dates, figs, and grapes. By 1918, however, the water table had become seriously depleted. The Coachella Valley County Water District was subsequently formed to promote water conservation and control distribution. With completion of a new and improved "All-American Canal" to irrigate the Imperial Valley in 1940, communities in the Coachella Valley began forming plans to tap into it. The Coachella Canal, 122 miles long, was built nine years later. Between 1933 and 1941, the Metropolitan Water District of Southern California built the Colorado River Aqueduct conveying water from the Colorado River at Lake Havasu on the California-Arizona border west across the Mojave and Colorado deserts to the east side of the Santa Ana Mountains. A portion of this aqueduct tunnels through the Coxcomb Mountains north of the Chuckwalla Valley and the PSEGS. (Ex. 2001, p. 4.3-36.)

Engineers began to dam western rivers for electricity in the 1890s, just as the hydraulic mining industry declined. The first electricity came to Blythe in 1917. Two 50-watt diesel engines generated power 18 hours a day. It was not until 1930 that this system was abandoned when a 70-mile-long transmission line was constructed connecting Blythe with Calipatria in the Imperial Valley. In the 1950s, the Blythe-Eagle transmission line was constructed. It was a 161-kV transmission line that connected the Blythe-Eagle Mountain Substation in Blythe to a substation near Eagle Mountain. The other transmission line in the vicinity of the PSEGS is the Devers-Palo Verde line, a 500-kV lattice-tower transmission line constructed in 1982. (Ex. 2001, p. 4.3-37.)

The mountains surrounding Chuckwalla Valley contain several valuable mineral deposits including copper, gold, silver, iron, quartz, manganese, and gypsum, with the only sustained mining having been iron mining in the eastern Eagle Mountains and gypsum mining at Midland in the Maria Mountains. The first gold strike in the desert region of Riverside County was a deposit located in the Mule Mountains in the spring of 1861. Gold and iron deposits may have been discovered as early as 1865 in the Eagle Mountains and by 1889 there was an established mining interest in those mountains. Today these mines are still in operation. (Ex. 2001, pp. 4.3-37 – 4.3-38.)

Mining in the Chuckwalla Mountains began in 1877 by a Mr. Hathaway (early on, the mountains were referred to as the Hathaway Mountains) of San Bernardino, but it was a gold strike in the late 1880s which started a gold rush to the area. Over the years, several mining interests in the Chuckwalla Mountains sprang up, transferred ownership and were eventually abandoned. (Ex. 2001, p. 4.3-38.)

In the early 1880s, Matt Palen and William McCoy prospected in the Palen, McCoy, and Maria Mountains, and, in 1880, Palen and H. Connor discovered copper deposits, as well as gold and silver, in the west-central portion of the Palen Mountains. Copper mining in the Palen Mountains appears to have reached its zenith during the second decade of the 20th century with activity at the Fluor Spar Group, Homestake Group, Crescent Copper Group, Orphan Boy, and Ophir mines. Most of these mines were abandoned by 1917. (Ex. 2001, p. 4.3-39.)

The Ironwood Mining District has been active since 1929 and encompasses claims in the Palen, McCoy, Arica, and Maria Mountains. Minerals mined in the Ironwood District include copper, gold, silver, zinc, lead, manganese, and gypsum. (Ex. 2001, p. 4.3-39.)

In 1942, during World War II, Gen. George S. Patton established the Desert Training Center/California-Arizona Maneuver Area in a sparsely populated region of southeastern California, Arizona, and Nevada. Camp Desert Center was located between Chiriaco Summit and the community of Desert Center. The Desert Center Army Airfield was situated just northwest of the community of Desert Center. (Ex. 2001, p. 4.3-40.)

During the Cold War years, relations between the United States and the Soviet Union were diplomatically strained, primarily as the result of the bi-lateral proliferation of nuclear weapons. Thus, amid worries of nuclear war, a two-week training exercise was launched in 1964 called Desert Strike. It involved over 100,000 men, 780 aircraft, 1,000 tanks, and 7,000 other vehicles along the banks of the Colorado River and adjoining desert valleys ranging over 150,000 square miles of California, Nevada, and Arizona. Heavy equipment such as the M60 tank was used during practice maneuvers and the track marks can still be seen across the desert. (Ex. 2001, p. 4.3-41.)

## Cultural Resources Inventory

The evidence describes the research methods used by the Petitioner and Energy Commission Staff for each phase and provides the results of the research, including literature and records searches (California Historical Resources Information System [CHRIS] and local records), archival research, Native American consultation, and field investigations. Staff provides a description of each identified cultural resource, recommendations on their historical significance, and the basis for those recommendations. Staff describes the “project area of analysis” (PAA) as a way to delineate the geographic area in which the proposed project has the potential to affect cultural resources. The geographic area that would encompass consideration of all such effects may or may not be one uninterrupted expanse. It may include the project area, which would be the site of the proposed plant (project site), the routes of requisite transmission lines and water and natural gas pipelines, and other off-site ancillary facilities, in addition to one or several discontinuous areas where it could be argued the project could potentially affect cultural resources. (Ex. 2001, p. 4.3-42.)

The PSEGS project will no longer use the parabolic trough technology, as originally licensed, but will instead use solar power towers, associated power blocks, and heliostat fields. Staff argues that the previous PAA used in the 2010 licensing was not adequate to analyze the potential effects that could occur given this change in technology. Specifically, switching from relatively low profile 25-foot-tall parabolic troughs to two 750-foot-tall power towers has the potential to effect cultural resources much farther away. Therefore, to adequately evaluate the new potential effects of the amended project, the revised PAA includes all visible areas within approximately 15 miles of the project area boundary (see **Cultural Resources - Figure 1**). As shown in **Cultural Resources - Figure 1**, the viewshed extends much farther than 15 miles in some areas, while in other areas the viewshed is less than 15 miles due to the area topography. Staff has determined that this would constitute the geographic area across which the project may have the potential to cast significant visual effects on cultural resources. The archaeological and built-environment components of the PAA for the PSEGS project have been expanded to include all visible areas within 15 miles of the project area boundary. The Ethnographic PAA encompasses the viewshed within which it would be possible to see one of the two proposed solar power towers. In general, the viewshed perimeter is delineated by the crests of the mountain ranges that define the combined Palen and Chuckwalla Valleys. The mountain ranges are the Granite Mountains, Palen Mountains, McCoy Mountains, Mule Mountains, Little Chuckwalla Mountains, Chuckwalla Mountains, Eagle Mountains and the Coxcomb Mountains. While some higher elevation areas beyond the first ring of mountains can be seen, and while some closer areas cannot be seen because of intervening canyon walls or other

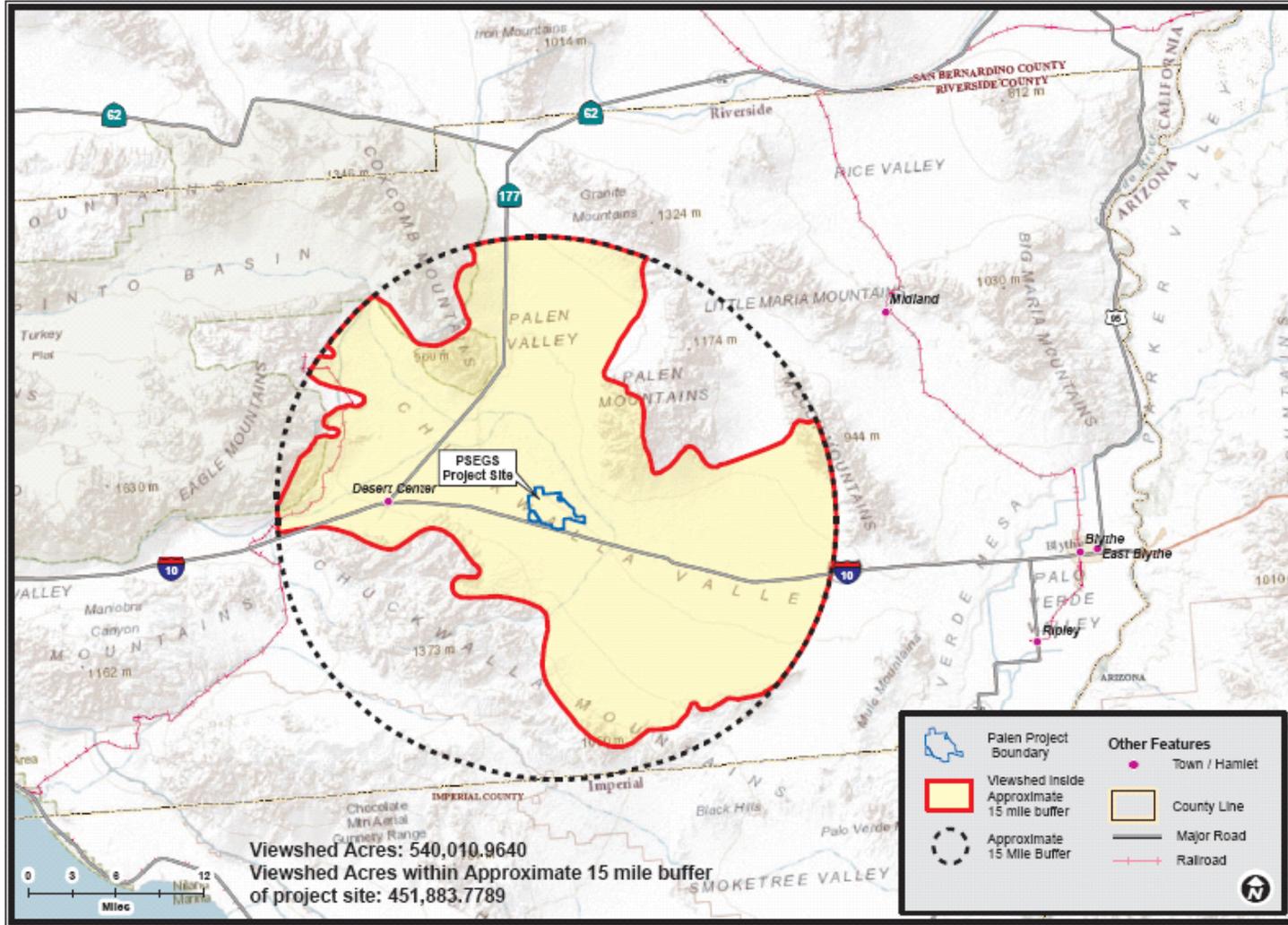
intruding visual obstacles, staff analyzed only those resources deemed to be reasonably within the viewshed of the solar power towers. Petitioner argues that Staff failed to use the difference in the visibility map it provided as Exhibit 25 and the full Visual Resource Analysis provided in Exhibit 34. Petitioner argues that Exhibit 25 provides a clear delineation of where the PSEGS can now be seen in areas where the Approved Project was not visible. (Ex. 1077, p.6.) CRIT agrees with Staff's approach and argues that Petitioner's maps do not take into account the difference in the magnitude of the visual intrusion between the PSEGS and PSPP projects. CRIT argues that with its 750-foot brilliant illuminated towers it is obvious that the PSEGS Project will be far more visible than the PSPP project, which was comprised of solar troughs only 30 feet tall. (Ex. 8027, p. 3.) We find Staff's PAA approach is reasonable. (Ex. 2001, pp. 4.3-42 – 4.3-44.)

Evidence in the record describes Staff's CHRIS records search, previous surveys, previously recorded resources, archival and library research results, results of local agency and organization consultations including local historical societies, consultation with the Native American Heritage Commission (NAHC) for information on Native American sacred sites and a list of Native Americans interested in the project vicinity, contacts with Native American tribes, and field investigations. (Ex. 2001, pp. 4.3-43–4.3-44.)

CRIT argues that notification and consultation in these proceedings has been insufficient. (Exs. 8022, p. 3; 8023, p. 8, 10-11; 8025, p. 4.) However, as stated in the Opening Testimony of Doug Bonamici, "[t]o its credit, the CEC seems to have made significant, positive improvements to its outreach policy and procedures. CRIT has had many contacts with Dr. Gates – all of them informative and cordial." (Ex. 8025, p. 4.) Consultation, as with any communication, is a "two-way street." We gather from the record that great efforts have been put forth by Staff and CRIT to find mutual understanding and cooperation. We recognize and encourage these efforts between the parties. While there is certainly room for improvement, we find that Staff's notice and consultation with Native Americans in this proceeding has been adequate. (Exs. 2000, pp. 4.3-43– 4.3-44; 8011; 8014.)

**CULTURAL RESOURCES - FIGURE 1**

Palen Solar Electric Generating System - Viewshed Acreage and Viewshed Acreage within Approximate 15 Mile Buffer of Project Site



(Ex. 2001, Figure - 1)

## **PROJECT IMPACTS TO CULTURAL RESOURCES AND MITIGATION**

The analysis in evidence considered the PSEGS impacts on archaeological resources, ethnographic resources, individual historic-period/built environment resources, cultural landscapes, and cumulative impacts to cultural resources.

When a cultural resource is determined to be significant, it is eligible for inclusion in the California Register of Historic Resources (CRHR). (Pub. Res. Code, § 5024.1; Cal. Code Regs., tit. 14, § 4850 et seq.) An archaeological resource that does not qualify as a historic resource may be considered a “unique” archaeological resource under CEQA (see Pub. Res. Code, § 21083.2). In addition, structures older than 50 years (or less if the resource is deemed exceptional) can be considered for listing as significant historic structures. The CEQA Guidelines define historical resources to include:

- (1) A resource listed in, or determined to be eligible by, the State Historical Resources Commission for listing in the CRHR;
- (2) A resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of section 5024.1(g) of the Public Resources Code; or
- (3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency’s determination is supported by substantial evidence in light of the whole record. (Cal. Code Regs., tit. 14, § 15064.5(a).)

Historical resources that are automatically listed in the CRHR include California historical resources listed in, or formally determined eligible for, the National Register of Historic Places (NRHP), as well as California Registered Historical Landmarks from No. 770 onward. (Pub. Res. Code, § 5024.1(d).) In general, to be considered historically significant under the CEQA Guidelines, a cultural resource must meet the criteria for listing in the CRHR. (Ex. 2001, pp. 4.3-77– 4.3-78.)

Direct impacts to cultural resources are those associated with project development, construction, and operation (co-existence). Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when, for example, those buildings or structures must be removed to make way for the proposed project or when the vibrations of construction impair the stability of historic buildings or structures nearby. New construction can have

direct impacts on historic built-environment resources when it is stylistically incompatible with their neighbors and the setting, and when the proposed project produces something harmful to the materials or structural integrity of the historic buildings and structures, such as emissions or vibrations. (Ex. 2001, p. 4.3-80.)

Indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic buildings and structures can suffer indirect impacts when project construction causes obsolescence and demolition or creates improved accessibility, making vandalism or greater weather exposure possible. (Ex. 2001, p. 4.3-81.)

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities and at a proposed construction laydown area, has the potential to directly impact unknown archaeological resources. The potential direct physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed project into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic built-environment resources. (Ex. 2001, p. 4.3-81.)

### **Archaeological Resources**

Twelve previously recorded resources were identified within the original 2009 study area, seven historic-period and five prehistoric archaeological sites. Five prehistoric resources were identified outside the original archaeological PAA. Four resources south of the project area included a remnant of a foot trail (CA-RIV-893T); a pottery sherd scatter (P-33-14160); a rock ring (P-33-14177); and an isolated quartz biface fragment (P-13591). One very large seasonal campsite, CA-RIV-1515, was identified and recorded by Ritter (1981), less than 0.5 mile to the northeast of the original PAA (see **Cultural Resources - Table 1** below). (Ex. 2001, pp. 4.3-45 – 4.3-46.)

**Cultural Resources - Table 1**  
**Previously Recorded Sites within the original Study Area (2009 Records Search Limits)**

Period	Primary # (P-33-)	Site Trinomial (CA-RIV-)	Site Type	Constituents
Historic	13592		Tin can scatter	Church key opened beverage cans, juice cans, meat tins
	13681		Isolate	Hole-in-cap can
	13964	7648	Tin can scatter & section marker	Tin cans & wood fragments
	14161		Isolate	General Infantry periscope style flashlight
	17137	8920	Tin can & glass scatter	Hole-in-top cans, evaporated milk cans, glass fragments
	17138	8921	Tin can & glass scatter	Tins cans, glass fragments, and milled lumber
	17766		Road Segment	Rte 60/70 w/ associated diversion dikes (Chuckwalla Rd)
Prehistoric	n/a	893T	Trail Segment	None
	n/a	1515	numerous widely dispersed loci of sparse lithics & FAR (fire-affected rock) scatters over an extensive area	FAR, core fragments, flakes, cores, hammer-stones, cobble chopper tools, milling tools, bone fragments, projectile point, pottery sherds, turquoise pendant, and ring of boulders. Rumored fishhooks, fish bone, and possible human remains (burials and cremations).
	13591		Isolate	Quartzite biface
	14160		Isolate	Incised pottery rim sherd and body sherd
	14177		Cleared Circle Ring	None

(Ex. 2001, p. 4.3-46.)

Staff identified nine prehistoric sites during field investigations within the different components of the project (facility footprint, facility access roads, temporary disturbance area, transmission line corridor, substation footprint, and substation access road); including five sparse lithic scatters and four sparse lithic and fire-affected rock (FAR) scatters (**Cultural Resources - Table 2**). (Ex. 2001, p. 4.3-55.)

**Cultural Resources - Table 2  
Prehistoric Resources on the Proposed Facility Site**

Site Ref. (SMP-P-)	Resource Type	Size (m)	Landform	Constituents	Other
1015	Lithic scatter	90x30	Gravel terrace	31 flakes & 2 cores (cryptocryst, metavolcanic, basalt, rhyolite)	Surficial
1016	Lithic scatter	45x25	Gravel terrace	7 flakes (cryptocryst, metavolc, basalt, quartz)	Surficial
1017	Lithic & FAR scatter	50x18	Deflated dune terrace	3 flakes (metavolcanic), quartzite hammerstone, piece ground stone, 60+ FAR frags	Possible subsurface deposit
1018	Lithic & FAR scatter	25x9	Deflated dune terrace	13 pieces metavolcanic debitage, 35 pieces FAR, metate frag	Possible subsurface deposit
2014	Lithic scatter	30x20	Dune	3 flakes & core (metavolcanic)	Possible subsurface deposit
2015	Lithic & FAR scatter	47x22	Dune at base of alluvial fan	40+ flakes (metavolc, cryptocryst), biface frag (basalt), domed scraper, core, 4 metate frags, 2 poss. metate frags, boulder with ground surface, and marine shell frag	Possible subsurface deposit
2018	Lithic & FAR scatter	54x28	Deflated dune on periphery of Dry Lake	Five clusters of FAR (126 pieces of basaltic, metavolcanic, and granitic rocks), a metavolcanic primary flake, cryptocrystalline biface-thinning flake, a quartz secondary flake, a metavolcanic hammerstone/ battered cobble	Possible subsurface deposit
2023	Lithic & FAR scatter	75x16	Alluvial fan	2 flakes, core, 8 metate fragments, 1 mano, & 6 pieces of FAR	Possible subsurface deposit
MT-001	Lithic scatter	60x20		1 rhyolite core/chopper, 1 rhyolite tested cobble, and 1 rhyolite core	Historic component, mid-20 <sup>th</sup> century can scatter and one screw-top glass bottle

(Ex. 2001, p. 4.3-55.)

There are three prehistoric archaeological sites from the original siting case (SMP-P-2018, SMP-P-2023, and SMP-P-MT-001) that remain in the revised PAA for the amended project. These three prehistoric sites, along with the six other such sites that

are not on the proposed facility site (SMP-P-1015, SMP-P-1016, SMP-P-1017, SMP-P-1018, SMP-P-2014, and SMP-P-2015), were assumed in 2010 for the purposes of CEQA to be eligible for listing in the CRHR. The three prehistoric sites that would remain subject to the amended project's effects, which are assumed to be historically significant, include one small sparse lithic scatter (SMP-P-MT-001) and two sparse scatters of lithic material and fire-affected rock (FAR) (SMP-P-2018 and SMP-P-2023). (Ex. 2001, p. 4.3-82.)

These three archaeological deposits may include subsurface components that have the potential to contribute information important to the prehistory of the region, consistent with Criterion 4 of the CRHR. None are likely to be found significant under Criteria 1–3 of the CRHR. (Ex. 2001, p. 4.3-83.)

CRIT argues that the Conditions of Certification for **CULTURAL RESOURCES** do not mitigate the impacts to cultural resources on site to levels of less than significant. (CRIT Opening Brief, pp. 14-18.) This issue was adjudicated in the Final Decision for the PSPP project, which involved the movement of 22 times the volume of soil as that proposed for the PSEGS. (Petitioner's Reply Brief, p. 7.) Specifically, the Decision found:

In conclusion, with the adoption and implementation of Staff's recommended **CULTURAL RESOURCES** Conditions, the PSPP would be in conformity with all applicable LORS. **CUL-1** and **CUL-2**, which we also adopt, would reduce the project's cumulative impacts to the PTNCL and DTCCCL to the greatest extent possible, but those impacts would still be cumulatively considerable. Conditions of Certification **CUL-3** through **CUL-15** would reduce the direct impacts to less than significant. (PSPP Final Decision, CEC-800-2010-011, **CULTURAL RESOURCES**, p. 29.)

We reject CRIT's claim that lessons learned from the Genesis Project constitute new evidence requiring the Commission to revisit its conclusions from PSPP. (CRIT Opening Brief, p. 17.) We agree with Petitioner and Staff that Genesis is a completely different project from PSEGS in both locale and design. (Ex. 1081, p. 8-11.) Most importantly, PSEGS does not involve the large-scale grading that was done at Genesis. (Ex. 2003, p.32.) Therefore, we find that the impacts to cultural resources that may be encountered on site are less significant for the PSEGS than for the PSPP because the PSEGS project is likely to disturb fewer buried cultural resources due to the substantial reduction in grading.

### **Historic- Built Environment Resources**

The resources on the project site were analyzed in detail in the FSA for the PSPP and summarized again in the FSA. (Ex. 2001, p. 4.3-126.)

## **Electric Power Transmission Line**

One resource related to electric power, SMP-H-1024, is a 1.75-mile segment of the Blythe-Eagle Mountain 161-kV transmission line and its service road that cuts approximately diagonally across the southwest corner of the proposed PSEGS plant site. The power line dates to the late 1950s. The segment consists of 11 sets of H-frame wooden supports consisting of two poles spaced about 15 feet apart with metal crossbeams at the top and ceramic insulators), carrying three conductors. Distances between supports are 775 feet. The PSPP Decision determined that the 161-kV Blythe-Eagle Mountain transmission line is not eligible for inclusion in the CRHR under any criteria. (Ex. 2001, p. 4.3-126.)

## **Town of Desert Center**

The town of Desert Center is located in eastern Riverside County approximately half way between Blythe and Indio. Eight of the 40 built-environment resources identified are associated with the Town of Desert Center: the Desert Center Café (P-33-5717); the Desert Center Post Office (P-33-5718); Stump Ranch (P-33-5719); Desert Steve Ragsdale Memorial Plaque and Grave (P-33-5720); “Hollywood Cabins” (P-33-5721); the Ragsdale House (P-33-6832); the Old School House (P-33-6833); and the Desert Center Red Brick School Building (P-33-21002). (Ex. 2001, p. 4.3-128.)

The record describes the history of Desert Center from its current location’s beginnings in 1927 through the addition of the Army Air Field buildings to the town after the closure of the DTC. The period of significance is from 1927 to 1950. Staff argues that there is not enough information provided to reach a conclusion that the district is not eligible for listing on the CRHR/NRHP for significance at either a local or state-wide level. Despite the deteriorating condition of the residential buildings associated with the early settlement of Desert Center, staff finds that the commercial core retains a high degree of integrity including location, design and materials. The core buildings, which might be eligible as a district with further evaluation, have retained their spatial relationships to the original route of travel. Therefore, staff asserts that the core structures, when considered as a district, may be eligible for inclusion on the CRHR under Criterion 1 as a representative of roadside development in the early automobile age. (Ex. 2001, pp. 4.3-128– 4.3-129.)

## **Eagle Mountain – Mine, Company Town, and Railroad**

Three of the built-environment resources are associated with Eagle Mountain: the Eagle Mountain Mine; Eagle Mountain Railroad; and the town of Eagle Mountain, collectively referred to as Eagle Mountain (the town and mine complex is located approximately 11 miles north of Desert Center). Only the Eagle Mountain Railroad is inside the established PAA for the PSEGS project, whereas the town and mine are outside. The

mine closed in 1983. Much of the housing stock was removed, left vacant, or vandalized. It is largely a ghost town today. The mine itself is behind locked gates. (Ex. 2001, p. 4.3-128.)

The railroad is significant for its association with the Eagle Mountain Mine and company town (P-33-6913), as well as the Kaiser Steel industrial complex and the Kaiser ship building industries. Because of this widespread contribution to industry, commerce and development, and direct association with the Kaiser Eagle Mountain Mine, Staff suggests that the Eagle Mountain Railroad may be eligible for listing on the NRHP/CRHR under Criterion 1. (Ex. 2001, pp. 4.3-129– 4.3-130.)

### **Colorado River Aqueduct and Eagle Mountain Pumping Station**

The Colorado River Aqueduct is a 242-mile long water conveyance system that extends from the Colorado River at the Whitsett Intake Pumping Plant at Lake Havasu on the California-Arizona border to Lake Mathews (formerly Cajalco Reservoir) in Riverside County, California. The system includes two reservoirs, five pumping stations, 63 miles of canals, 92 miles of tunnels, and 84 miles of buried conduit and siphons. The portion within the PAA is largely underground, surfacing at the Eagle Mountain Pumping Station. The Eagle Mountain Pumping Station located within the PAA is significant as a contributing element to the Colorado River Aqueduct as one of five pumping stations. In addition, the Eagle Mountain Pumping Plant has been found individually eligible for listing on the NRHP/CRHR under Criterion C/3 for its Art Deco architectural style. Staff asserts that it is eligible for listing on the NRHP/CRHR for its architectural style and association with an engineering landmark. (Ex. 2001, pp. 4.3-130– 4.3-131.)

### **Summary of PSEGS' Impacts to Historic-Period/Built-Environment Resources and Mitigation**

Evidence indicates that the town of Desert Center, the Eagle Mountain Railroad, and the Colorado River Aqueduct, including the Eagle Mountain Pumping Station, may be eligible for listing on the NRHP/CRHR. These resources have been fully described in the record. (Ex. 2001, p. 4.3-131.)

We accept Staff's uncontested determination that the PSEGS and related transmission facilities approximately seven miles away from the town of Desert Center will not have a significant visual impact on the localized setting to such a degree that its status as an eligible historical resource could be jeopardized. Therefore, no mitigation is required. (Ex. 2001, p. 4.3-131.)

We also accept Staff's undisputed conclusion that the potential visual impact of PSEGS on the subject portions of the Colorado River Aqueduct and the Eagle Mountain Pumping Station would not be of such a magnitude as to substantively degrade the ability of either to convey their respective associative, or design and construction

values. Key aspects of the resources' integrity, the respective setting, feeling, and association for each resource, would largely remain intact. As such, we agree with Staff that the potential visual impacts of PSEGS on these resources would be less than significant. Therefore, we will impose no mitigation. We reach a similar conclusion with regard to the potential impacts of PSEGS on the Eagle Mountain Railroad. The distance of the PSEGS from the railroad would not degrade the ability of the resource to convey its significance either as a contributing element to the Eagle Mountain Mine, town of Eagle Mountain, and Eagle Mountain Railroad, either collectively or as individual historical resources. We therefore impose no mitigation for what we find would be PSEGS' less-than-significant visual impact on the Eagle Mountain Railroad. (Ex. 2001, p. 4.3-132.)

In a similar vein, Staff described the "Ironwood Mining District." The district begins to the northeast of the facility site in the Palen Mountains and ranges throughout the Palen, McCoy, Little Maria, and Granite Mountains. There was a significant amount of mining activity in the Palen Mountains prior to the organization of the Ironwood district in approximately 1929 (see discussion in "The Project Setting" section above). (Ex. 2001, p. 4.3-101.)

Staff conducted an informal, limited, and by their terms "imprecise" reconnaissance on July 16, 2013, in a limited area on the southwestern side of the Palen Mountains. Staff's brief meandering transect through the mouth of the local valley led to the observation of several bedrock prospects of what appeared to be copper-bearing ores, a number of mine adits, one adit complex with relatively extensive tailings of a talc-like mineral deposit, a wooden loading chute, and multiple apparent rock cairns that may be discovery monuments, as well as mining claim boundary markers. Absent any more specific data, staff recommended a technical regulatory assumption of CRHR eligibility under at least Criteria 1 and 4 for the portion of the cultural resource that staff tentatively designates here as the Ironwood Historic Mining District (that portion of the district within the viewshed of the proposed facility), and recommended the further technical assumption that the tentatively designated Southwestern Palen Mountains Mining Area would contribute to the CRHR eligibility of the district should it ever be found as a whole to be so eligible. Staff recommended Condition of Certification **CUL-17** that required surveys of the southwestern Palen Mountain mining area to document historic archeological deposits, document both placer and load deposits and assays of those deposits. (Ex. 2001, pp. 4.3-101– 4.3-102.)

At the evidentiary hearing, Petitioner's expert testified in detail regarding the history, condition, and cultural significance of the pyrophyllite and talc deposits. According to testimony, these mining operations are not picturesque and do not contain the steep shafts and elevators of the type of operations such as Cripple Creek or Virginia City.

The area is simply “bladed” with a bulldozer such that the main characteristic of these mining deposits is ground disturbance in itself. The testimony pointed out that Staff’s recommended Condition of Certification **CUL-17** required assays conducted for the ore deposits, but Petitioner’s expert pointed out that the job of an archeologist is not to prove up a claim, but rather to record the historical characteristics of it. Petitioner’s expert testified that none of the claims that Staff observed would have been accepted as a factor in determining the eligibility of the Ironwood Mining District. (10/28/13 RT 82:16- 85:10.)

We find that the state of the evidence is insufficient to establish that the subject section of the Ironwood Mining District qualifies as a cultural resource, let alone whether the PSEGS would have any impact on it. Therefore, we will not impose Staff’s recommended Condition of Certification **CUL-17**.

## **ETHNOGRAPHIC RESOURCES**

### **Palen Dunes/Palen Lake**

The Palen Dunes/Palen Lake is a traditional cultural property (TCP) located on the floor of the Chuckwalla Valley west of the Palen Mountains and southeast of the Coxcomb Mountains. The closest portion is less than one mile northeast of the PSEGS project. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely for logistical forays into the area for locally procured resources such as mesquite and palo verde beans, salt brush, grasses and other hard seed plants, desert tortoise, and rabbits. There are reports of cremations at some of the recorded sites in the TCP. Site CA-RIV-201 was initially recorded in the early 20th century as a large village site with a cremation area, ceramics, milling equipment, and many small projectile points. The evidence regarding cremations at the site is equivocal. (Ex. 2001, p. 4.3-103.)

Since the Late Pleistocene, Palen Lake has only been ephemerally filled, and most of the water seeps into the sand dunes that surround the lake, creating a habitat in which plant species that require more water than the typical creosote-scrub brush, which is present at throughout the valley. These unique plants and the animals drawn to them served as an important resource to prehistoric Native Americans, and the vast amount of extant artifacts throughout the TCP, especially in the blowout areas on the playa surface, continue to be culturally significant resources for contemporary Native Americans who continue to frequent this area. The presence of potential cremation sites is especially significant to contemporary Native American groups, and the protection of these resources is of the utmost importance to them. Visiting these resources helps to contribute to Native Americans’ sense of cultural identity because it helps them to better

understand the lifeways of their ancestors, and the artifacts serve as a direct link to their past. The Palen Dunes/Palen Lake TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-103.)

The period of significance for the Palen Dunes/Palen Lake TCP spans from time immemorial, the beginning of creation up to 1936 when US Route 60-70 between Indio and Blythe became a paved highway. CRIT disagrees that the period of significance for traditional cultural properties and the Chuckwalla Portion of the PRGTL ended in 1936. Given the ongoing use of the Palen Dunes/Palen Lake TCP, Ford Dry Lake TCP, North Chuckwalla Prehistoric Quarry District TCP, Long Tank TCP, Alligator Rock TCP, San Pascual Well TCP, and the Chuckwalla Valley portion of the PRGTL cultural landscape (e.g., FSA 4.3-103, 106, 117) CRIT asserts that the period of significance must be revised to include the present day. (Exs. 2000, pp. 4.3-104; 106, 117; 8023, p.6.) We see no reason not to assume that the period of significance for these TCPs carries to the present.

The boundaries of the Palen Dunes/Palen Lake TCP are not precisely defined because the entire vicinity of the dunes and lake area and all of the contributing elements has not been inventoried. Staff considers the boundaries of the Palen Dunes/Palen Lake TCP to include the dry lake and the surrounding dunes and mesquite hummocks encompassing the approximately 16 recorded sites in the vicinity of the dunes and lake, as well as several of the trail features that head towards and pass through the TCP. (Ex. 2001, pp. 4.3-104– 4.3-105.)

The Palen Dunes/Palen Lake TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of their ancestor's lifeways and burial practices, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples lived, worked, and possibly cremated deceased family members, and ecologically represents a unique wetland environment in this xeric landscape. On a regional level, the Palen Dunes/Palen Lake TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the large number of temporary camps and associated resource processing artifacts that have been identified, as well as the importance of the area into the Proto-historic and Historic periods. Criteria 4 applies to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, p. 4.3-105.)

The integrity of the Palen Dunes/Palen Lake TCP has been visually and physically compromised by the establishment of a BLM road through the northern portion of the

TCP and along the eastern margin of the area, refuse from historic and modern vehicle traffic through the region, looting and vandalism of some of the archaeological sites, natural environmental dune processes that affect the provenience of artifacts, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains and west in the Palen Mountains, the town of Desert Center, State Route 177, the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation, and the Desert Sunlight Solar Farm. However, despite these intrusions, Staff argues the Palen Dunes/Palen Lake TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral wetland environment amid an arid landscape, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-105.)

### **Ford Dry Lake**

The Ford Dry Lake is a TCP located on the floor of the Chuckwalla Valley, south-southeast of the Palen Mountains and southwest of the McCoy Mountains, about nine miles east of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely for logistical forays into the area for locally procured resources. Since the Early Holocene, Ford Dry Lake has only been ephemerally present, but as indicated by the many temporary camps and resource processing areas in the vicinity of Ford Dry Lake, this area served as an important resource to prehistoric Native Americans. The vast amount of extant artifacts throughout the TCP, especially in the blowout areas on the playa surface, continues to be culturally significant resources for contemporary Native Americans who continue to frequent this area. Some Native Americans regard the Ford Dry Lake area as a place with a high potential for cremation sites, and one site identified during construction monitoring of the Genesis Solar Energy Project consisting of an inverted metate has been interpreted as a possible cremation. The presence of potential cremation sites is especially significant to contemporary Native American groups, and the protection of these resources is of the utmost importance to them. The Ford Dry Lake TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, pp. 4.3-106– 4.3-107.)

The boundaries of the Ford Dry Lake TCP are not precisely defined because the entire vicinity of the lake area and all of the contributing elements have not been inventoried. Staff considers the boundaries of the Ford Dry Lake TCP to include the dry lake and the surrounding recorded archaeological sites in the vicinity of the lake, as well as several of the trail features which head towards and pass through the TCP. (Ex. 2001, p. 4.3-107.)

The Ford Dry Lake TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of their ancestors' lifeways and burial practices, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples lived, worked, and possibly cremated deceased family members, and ecologically represents a unique ephemeral lake environment in this xeric landscape. On a regional level, the Palen Dunes/Palen Lake TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the large number of temporary camps and associated resource-processing artifacts that have been identified, as well as the importance of the area into the Proto-historic and Historic periods. Criteria 4 applies to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, p. 4.3-107.)

The integrity of the Ford Dry Lake TCP has been visually and physically compromised by the establishment of a BLM road through the northern and western portions of the TCP, refuse from historic and modern vehicle traffic through the region, looting and vandalism of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, the Chuckwalla Valley State Prison, the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation and the Genesis Solar Energy Project. However, despite these intrusions, Staff argues that the Ford Dry Lake TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral lake environment amid an arid landscape, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-107.)

### **McCoy Spring (CA-RIV-0132)**

McCoy Spring is a TCP located in the western portion of the McCoy Mountains about 16 miles northeast of the PSEGS project area and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until after the floods. McCoy Spring not only provided a source of water, but the canyon walls and boulders that surround the spring served as a medium for over 1,000 petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times, as well as a depiction of events during Proto-historic times, and the rock art panels at McCoy

Spring contribute to the cultural identity of the Native Americans who still visit the site today. The McCoy Spring TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-108.)

The period of significance for the McCoy Spring TCP spans from time immemorial, the beginning of creation, up to the present. The boundaries of the McCoy Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Staff considers the boundaries of the McCoy Spring TCP to include the spring itself and the surrounding canyon walls and boulders, and the trails emanating from the spring which head in numerous directions North, West, and South. (Ex. 2001, p. 4.3-109.)

The McCoy Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American people found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. McCoy Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Proto-historic and Historic periods. (Ex. 2001, p. 4.3-109.)

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle, and rock ring is a unique expression of the creator of the communicative device and, while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship. Criteria 4 applies to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, rituals, and beliefs. (Ex. 2001, p. 4.3-109.)

The integrity of the McCoy Spring TCP has been visually and physically compromised by the construction of a cap-over spring, modern and historic vandalism and looting, the historic mining and associated infrastructure in the vicinity, refuse, tank tracks, and other military features associated with the DTCCCL, the I-10 corridor and the large transmission lines that parallel the freeway, the Chuckwalla Valley State Prison, as well as the recently constructed Genesis Solar Energy Project. However, despite these intrusions, Staff asserts that the McCoy Spring TCP is still relatively pristine and

conveys the feeling of an oasis amidst an arid landscape, thus maintaining integrity of workmanship, association, feeling, setting, and location. (Ex. 2001, p. 4.3-110.)

### **Chuckwalla Spring (CA-RIV-0262)**

Chuckwalla Spring is a TCP located in the northern portion of the Chuckwalla Mountains about 13 miles south of the PSEGS project area and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time, most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided. Chuckwalla Spring not only provided a source of water, but the canyon walls and boulders that surround the spring served as a medium for many petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times as well as a depiction of events during Protohistoric times, and the rock art panels at Chuckwalla Spring contribute to the cultural identity of the Native Americans who still visit the site today. The Chuckwalla Spring TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-110.)

The period of significance for the Chuckwalla Spring TCP spans from time immemorial, the beginning of creation up to the present. The boundaries of the Chuckwalla Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Based on the currently available information, Staff considers the boundaries of the Chuckwalla Spring TCP to include the spring itself and the surrounding documented lithics, cleared circles, ceramics, and trails. (Ex. 2001, p. 4.3-112.)

The Chuckwalla Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American people found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Chuckwalla Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods. (Ex. 2001, p. 4.3-112.)

Chuckwalla Spring is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic

value. Each petroglyph, cleared circle, and rock ring is a unique expression of the creator of the communicative device and, while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship. Criteria 4 also applies to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, ritual and belief. (Ex. 2001, p. 4.3-112.)

The integrity of the Chuckwalla Spring TCP has been visually and physically compromised by historic mines and mining roads, modern and historic vandalism and looting. The northern portion of the TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway. However, despite these intrusions, the Chuckwalla Spring TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining the integrity of Workmanship, Association, Feeling, Setting, and Location. (Ex. 2001, p. 4.3-112.)

### **Corn Spring (CA-RIV-032)**

Corn Spring is a TCP located in the eastern portion of the Chuckwalla Mountains, about 6.75 miles southwest of the PSEGS project area and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, but also for more extended periods of time most likely when the Colorado River seasonally overflowed its banks and groups retreated onto the mesa until the floods subsided. Corn Spring not only provided a source of water that Native Americans used to irrigate crops, in particular corn, but the canyon walls and boulders that surround the spring served as a medium for over 600 petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times, as well as a depiction of events during Proto-historic times, and the rock art panels at Corn Spring contribute to the cultural identity of the Native Americans who still visit the site today. The Corn Spring TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-113.)

The period of significance for the Corn Spring TCP spans from time immemorial, the beginning of creation up to the present. The boundaries of the Corn Spring TCP are not precisely defined because the entire vicinity of the spring and all of the contributing elements have not been inventoried. Staff considers the boundaries of the Corn Spring TCP to include, from west to east, the segment of trail adjacent to Aztec Well and the surrounding canyon walls following the wash east including the Corn Spring site extending east into the wash and desert pavement area encompassing the trail

segments heading east out of the canyon, as well as the petroglyph sites, cleared circles, rock rings, and trail shrines along these trails. (Ex. 2001, p. 4.3-114.)

The Corn Spring TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles, and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Corn Spring also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Proto-historic and Historic periods. (Ex. 2001, p. 4.3-114.)

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle, and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship. Criteria 4 also applies to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, rituals and beliefs. (Ex. 2001, p. 4.3-115.)

The integrity of the Corn Spring TCP has been visually and physically compromised by the modern developments at the site (i.e., a cap on the spring, the BLM campground, and the BLM access road), historic mines, mining roads, and a related historic cabin, the fact that the spring no longer flows, modern and historic vandalism and looting, and invasive tamarisk species. The eastern portion of the TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway, as well as the recently constructed Red Bluff Substation and the Genesis Solar Energy Project. However, despite these intrusions, Staff asserts that the Corn Spring TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining the integrity of workmanship, association, feeling, setting, and location. (Ex. 2001, p. 4.3-115.)

### **North Chuckwalla Petroglyph District (CA-RIV-01383)**

The North Chuckwalla Petroglyph District is an NRHP-listed property located in the northern portion of the Chuckwalla Mountains about 4 miles west of the PSEGS project area and was, and continues to be, an important destination along the trail network

within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, and the myriad boulders that are encompassed in the TCP served as a medium for over 170 petroglyph panels. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times as well as a depiction of events during Proto-historic times, and the rock art panels at the North Chuckwalla Petroglyph District contribute to the cultural identity of the Native Americans who still visit the site today. The North Chuckwalla Petroglyph District TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-115.)

The period of significance for the North Chuckwalla Petroglyph District TCP spans from time immemorial, the beginning of creation up to the present. Based on the currently available information, staff considers the boundaries of the North Chuckwalla Petroglyph District TCP to include all of the boulders that have petroglyphs, the rock rings, cleared circles, trails, and archaeological artifacts and features in the vicinity of the TCP. (Ex. 2001, p. 4.3-116.)

The North Chuckwalla Petroglyph District TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs, cleared circles, and rock rings in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American people found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. The North Chuckwalla Petroglyph District also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods. (Ex. 2001, p. 4.3-116.)

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs, cleared circles, and rock rings that exhibit a high degree of artistic value. Each petroglyph, cleared circle, and rock ring is a unique expression of the creator of the communicative device and while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship. Criteria 4 also applies to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and rituals and beliefs. (Ex. 2001, p. 4.3-117.)

The integrity of the North Chuckwalla Petroglyph District TCP has been visually and physically compromised by the transmission lines that intersect the site, associated

access roads, refuse, tank tracks, and other military features associated with the DTCCCL, the 1-10 freeway, modern and historic vandalism and looting, the Town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation, and Desert Sunlight Solar Farm. However, despite these intrusions, Staff argues that the North Chuckwalla Mountains Petroglyph District TCP is still relatively pristine and conveys the feeling an important location along a trail network, thus maintaining integrity of workmanship, association, feeling, setting, and location. (Ex. 2001, p. 4.3-117.)

#### **North Chuckwalla Prehistoric Quarry District (CA-RIV-01814)**

The North Chuckwalla Prehistoric Quarry District is a TCP located on the northeast slopes of the Chuckwalla Mountains, about 6.5 miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail for the acquisition of Aplite, a fine-grained intrusive felsic rock found throughout the quarry site that was desired for its fracturing qualities. In addition to a large number of lithic artifacts, rock shelters, rock rings, and trails are also present at the site, indicative of its multiple uses as a temporary camp and stop along the trail corridor in this portion of the Chuckwalla Valley. The vast amount of extant artifacts throughout the TCP continues to be culturally significant resources for contemporary Native Americans who frequent this area. Rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Visiting these resources helps to contribute to Native Americans' sense of cultural identity because it helps them to better understand the lifeways of their ancestors, and the artifacts serve as a direct link to their past. The North Chuckwalla Prehistoric Quarry District TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-117.)

Staff considers the boundaries of the North Chuckwalla Prehistoric Quarry District TCP to consist of the at least 84 documented lithic reduction loci, in addition to the rock shelter and several of the trail features which head towards and pass through the TCP. (Ex. 2001, p. 4.3-118.)

The North Chuckwalla Prehistoric Quarry District TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of their ancestors' lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired lithic materials on a large scale. On a regional level, the North Chuckwalla Prehistoric Quarry District TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network

evidenced by the large number of temporary camps and associated resource-processing artifacts that have been identified, as well as the importance of the area into the Protohistoric and Historic periods. Criteria 4 also applies to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lithic technology, lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, p. 4.3-118.)

The integrity of the North Chuckwalla Prehistoric Quarry District TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCCL, historic and modern mining to the east in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions, Staff claims that the North Chuckwalla Prehistoric Quarry District TCP is still relatively pristine and conveys the feeling of a prehistoric lithic quarry, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-119.)

### **Long Tank**

Long Tank is a TCP located in the Alligator Rock ACEC, on the northern slope of the Chuckwalla Mountains, about 10 miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. It was occupied by groups temporarily as a stop along the trail in order to access the granite tanks, which are known to hold water, and was a spot to stop for water along the Chuckwalla Valley trail corridor. This tank location is a culturally significant place for the contemporary Native American groups who visit the site. Moreover, rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Water places in particular are important resource locations for Native American groups. The Long Tank TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-119.)

The boundaries of the Long Tank TCP are not precisely defined because the entire vicinity of the TCP and all of the contributing elements have not been inventoried. Staff considers the boundaries of the Long Tank TCP to include the granite tanks and the area around the tanks. (Ex. 2001, p. 4.3-119.)

The Long Tank TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestors' lifeways, and the deep oral tradition that is

understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired water while travelling along this portion of the trail corridor in the Chuckwalla Valley. On a regional level, the Long Tank TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network, as well as the importance of the area in the Protohistoric and Historic periods indicated by its noted location by early miners in the region. Criteria 4 applies to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, pp. 4.3-119 – 4.3-120.)

The integrity of Long Tank TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCCL, historic and modern mining to the northeast in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, and State Route 177, as well as the recently constructed Desert Sunlight Solar Farm. However, despite these intrusions, Staff argues that the Long Tank TCP is still relatively pristine and conveys the feeling of a trailside water tank, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-120.)

### **Alligator Rock**

Alligator Rock is a TCP located adjacent to the north portion of the Chuckwalla Mountains, about nine miles west of the PSEGS project area. This is a place that was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail for the acquisition of Aplite. In addition to a large number of lithic artifacts, metates and ground stone tools, trails are also present at this place indicative of its multiple uses as a temporary camp and stop along the trail corridor in this portion of the Chuckwalla Valley. The vast amount of extant artifacts throughout the TCP continues to be a culturally significant resource for contemporary Native Americans who frequent this area. Rock outcroppings, rock features, and trails are considered to be physical links to the past that possess significance to living peoples. Members of the La Cuna de Atzlan organization suggest that Alligator Rock has spiritual significance (Ex. 5000). The adjacent Chuckwalla Mountains were likely named for the desert reptile, the large Chuckwalla lizard, and it is understood by these members that Alligator Rock is a part of these “Lizard Mountains,” and represents the lizard. Visiting these resources helps to contribute to Native Americans’ sense of cultural identity because it helps them to better understand the lifeways of their ancestors, and the artifacts serve as a direct link to their

past. The Alligator Rock TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, pp. 4.3-120 – 4.3-121.)

The boundaries of the Alligator Rock TCP are not precisely defined because the entire vicinity of the TCP and all of the contributing elements have not been inventoried. Staff considers the boundaries of the Alligator Rock TCP to include the geologic landform itself and the several lithic reduction sites, rock rings, temporary camps, and trails in the vicinity of Alligator Rock. (Ex. 2001, p. 4.3-121.)

The Alligator Rock TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of the their ancestors' lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired lithic materials on a large scale. On a regional level, the Alligator Rock TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the temporary camps and associated resource processing artifacts that have been identified, as well as the importance of the area into the Proto-historic and Historic periods. Criteria 4 is applicable to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lithic technology, lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, pp. 4.3-121 – 4.3-122.)

The integrity of Alligator Rock TCP has been visually and physically compromised by the refuse from historic and modern vehicle traffic through the region, looting of some of the archaeological sites, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains and south in the Chuckwalla Mountains, the I-10 corridor, and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation, and the Desert Sunlight Solar Farm. However, Staff asserts that despite these intrusions, the Alligator Rock TCP is still relatively pristine and conveys the feeling of a prehistoric lithic quarry, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-122.)

### **Dragon Wash (CA-RIV-049)**

Dragon Wash is a TCP located in the eastern portion of the Eagle Mountains about 14 miles west of the PSEGS project area and was, and continues to be, an important destination along the trail network within the Chuckwalla Valley. This place was occupied by groups temporarily as a stop along the trail, and the canyon walls and boulders that surround the wash served as a medium for several dozen petroglyphs. In fact, rock art is often found near water sources. All rock art is understood to be a symbol of the sacred past, a pictorial representation of the events and activities of the Creator during sacred times as well as a depiction of events during Protohistoric times, and the rock art panels at Dragon Wash contribute to the cultural identity of the Native Americans who still visit the site today. The Dragon Wash TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-122.)

The period of significance for the Dragon Wash TCP spans from time immemorial, the beginning of creation up to the present. The boundaries of the Dragon Wash TCP are not precisely defined because the entire vicinity of the wash and all of the contributing elements has not been inventoried. Staff considers the boundaries of the Dragon Wash TCP to include the wash and canyons that make up the mouth of the wash and the large rock outcrops less than 0.5 miles southwest of the wash. (Ex. 2001, pp. 4.3-123 – 4.3-124.)

The Dragon Wash TCP is eligible under Criteria 1 at the regional level for its broad contributions to the unique historic events that shape Native American understanding of the petroglyphs in the TCP, and the deep oral tradition that is understood to be related to these spiritual communications. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples found and commemorated their spiritual world, and helps to promote and preserve the spiritual life and well-being of the Native American people. Dragon Wash also contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network evidenced by the extensive petroglyphs, many of which exhibit a dark patina indicating substantial age, as well as the importance of the site into the Protohistoric and Historic periods. (Ex. 2001, p. 4.3-124.)

This TCP is also eligible under Criteria 3 for its contributions to the production of the petroglyphs that exhibit a high degree of artistic value. Each petroglyph is a unique expression of the creator of the communicative device and, while there may be similar designs at other sites in the Chuckwalla Valley, these are not replicable and are therefore of a unique craftsmanship. Criteria 4 applies to this TCP for the potential of the site to contribute to our understanding of the prehistory of the PRGTL in southeastern California, the prehistory of the Chuckwalla Valley, and the prehistory of religion, and ritual and belief. (Ex. 2001, p. 4.3-124.)

The integrity of the Dragon Wash TCP has been visually and physically compromised by the construction of a transmission line and associated access road that bisects the TCP, historic mining and mining roads associated with Eagle mine, and historic vandalism. The TCP looks out over the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, and State Route 177, as well as the recently constructed Red Bluff Substation and the Desert Sunlight Solar Farm. However, despite these intrusions Staff argues that the Dragon Wash TCP is still relatively pristine and conveys the feeling of an oasis amidst an arid landscape, thus maintaining the integrity of workmanship, association, feeling, setting, and location. (Ex. 2001, p. 4.3-124.)

### **San Pascual Well**

The San Pascual Well TCP is located in a wash on the valley floor of the Chuckwalla Valley and is about five miles northwest from the PSEGS project area. The Native American well was initially relocated during the Romero-Estudio expedition in 1823-1824 while attempting to establish a route for Euro-Americans to cross the Colorado Desert and more efficiently connect the Los Angeles area to the Tucson region. The expedition named the well San Pascual, and Estudio's entry in his diary states "we found signs of basket-making by the Indian women on several occasions, bones of horses and pieces of ollas." Evidence suggests that this well was in the Desert Center area based on the landmarks provided in the diary, and the fact that the expedition was likely headed for Palen Pass. A General Land Office map from 1856 identifies "a well 45 feet deep of fair water in this quarter section." This well location is a culturally significant place for the contemporary Native American groups who visit the site. Water places in particular are important resource locations for Native American groups. The San Pascual Well TCP is a contributing element to the Chuckwalla Valley portion of the PRGTL. (Ex. 2001, p. 4.3-125.)

The boundaries of the San Pascual Well TCP are not precisely defined because the entire vicinity of the well and all of the contributing elements has not been inventoried. (Ex. 2001, p. 4.3-125.)

The San Pascual Well TCP is eligible under Criteria 1 at the regional and local level for its broad contributions to the unique historic events that shape Native American understanding of their ancestors' lifeways, and the deep oral tradition that is understood to be related to their ancestors. This place identifies one of several locations in the Chuckwalla Valley where Native American peoples acquired water while travelling along this portion of the trail corridor in the Chuckwalla Valley. On a regional level, the San Pascual Well TCP contributes to the unique historical events surrounding travel, trade, and movement along the PRGTL, and was an important place in the trail network, as well as the importance of the area into the Proto-historic and Historic periods indicated

by its use and mention by early explorers in the region. Criteria 4 applies to this TCP for the potential of this place to contribute to our understanding of the prehistory of the PRGTL in southeastern California and the prehistory of lifeways, trade, and movement in the Chuckwalla Valley. (Ex. 2001, pp. 4.3-125 – 4.3-126.)

The integrity of the San Pascual Well TCP has been visually and physically compromised by the construction of the Desert Center Airfield and Chuckwalla Raceway, refuse from historic and modern vehicle traffic through the region, natural environmental dune processes that affect the provenience of artifacts, refuse, tank tracks, and other military features associated with the DTCCL, historic and modern mining to the east in the Eagle Mountains, the I-10 corridor and the large transmission lines that parallel the freeway, the town of Desert Center, State Route 177, as well as the recently constructed Red Bluff Substation, and the Desert Sunlight Solar Farm. However, despite these intrusions Staff asserts that the San Pascual Well TCP is still relatively pristine and conveys the feeling of a repeated-use area in an ephemeral wetland environment amid an arid landscape, thus maintaining the integrity of association, feeling, setting, and location. (Ex. 2001, p. 4.3-126.)

### **Prehistoric Trails**

CRIT claims that prehistoric trails were not evaluated. (CRIT Opening Brief, p.11.) This issue was adjudicated in the Final Decision for the PSPP project. Specifically the decision found:

Of the resources evaluated, Staff concluded that the proposed project would have a significant direct impact on 49 resources either recommended eligible or assumed eligible for either the National Register of Historic Places and/or California Register of Historical Resources.

These impacts include:

- Direct impacts to nine prehistoric archaeological sites, all potential contributors to a prehistoric cultural landscape (historic district) identified by Staff and designated as the Prehistoric Trails Network Cultural Landscape (PTNCL); and,
- Cumulative impacts to the PTNCL and the DTCCL, resulting from the PSPP's impacts to contributors to these assumed register-eligible resources. (PSPP Final Decision, CEC-800-2010-011, **CULTURAL RESOURCES**, pp. 27-28.)

CRIT has introduced no new evidence of specific locations of new trail segments that were not analyzed in the PSPP Final Decision.

Further the PSPP Decision found:

Cultural Resources

In conclusion, with the adoption and implementation of Staff's recommended **CULTURAL RESOURCES** conditions, the PSPP would be in conformity with all applicable LORS. Conditions of Certification **CUL-1** and **CUL-2**, which we also adopt, would reduce the project's cumulative impacts to the PTNCL and DTCCL to the greatest extent possible, but those impacts would still be cumulatively considerable. Conditions of Certification **CUL-3** through **CUL-15** would reduce the direct impacts to less than significant. (PSPP Final Decision, CEC-800-2010-011, **CULTURAL RESOURCES**, p. 29.)

### **Summary of PSEGS Impacts to Ethnographic Resources and Mitigation**

Staff contends that all 11 ethnographic resources/TCPs evaluated above are eligible for the CRHR, and would be subject to direct visual impacts from the construction, operation, and decommissioning of the PSEGS. Staff submits that the 11 TCPs, all contributing elements to the Chuckwalla portion of the PPRGTL, should be considered mitigated to the extent possible, by considering mitigations to the PRGTL cultural landscape. (Ex. 2001, p. 4.3-126.)

### **Cultural Landscapes**

During the course of the original licensing of the PSPP, Staff designated and evaluated a discontinuous cultural landscape that incorporates prehistoric archaeological resources associated with the Halchidhoma Trail (CA-RIV-0053T). The Energy Commission determined the landscape was eligible for listing in the California Register of Historical Resources. That landscape was referred to in the documents and the conditions of certification that came out of the original licensing case, and in the subsequent research that has been done in partial fulfillment of those conditions as the Prehistoric Trails Network Cultural Landscape (PTNCL). Staff testified in the PSEGS amendment proceeding that the PTNCL represents, simultaneously, small geographic and temporal portions of a much broader regional Pacific to Rio Grande Trails Landscape (PRGTL) a cultural landscape that encompasses three primary trail corridors from the southern Pacific coast of California across the deserts and the Colorado Plateau of the Southwest to the northern Rio Grande Valley in what is now New Mexico. Staff testified that the focus here on the Chuckwalla Valley portion of the PRGTL is appropriate to the consideration of the amended project. (Ex. 2001, pp. 4.3-83 – 4.3-84.)

Staff describes the elements that bound the landscape. The exterior boundary of the Chuckwalla Valley portion of the PRGTL is the horizon of the viewshed from the trail routes. In the case of the subject portion of Chuckwalla Valley, the ridge crests of the Palen, Coxcomb, Eagle, Chuckwalla, Little Chuckwalla, and McCoy Mountains delineate much of the boundary of the PAA for the amended project's visual effects to

cultural resources. Staff describes some of the prehistoric archaeological deposits that contribute to the historical significance of the Chuckwalla Valley portion of the PRGTL located in and around the surrounding mountain ranges, including the Palen Dry Lake Area of Critical Environmental Concern (ACEC), the Coxcomb Fringe and Raceway Mesquite Areas. (Ex. 2001, p. 4.3-84 – 4.3-89.)

The two overlapping cultural landscapes in evidence are the PRGTL and the DTCCL. Both landscapes are multi-component cultural resources that variably represent mosaics of contributing elements that may include single archaeological deposits, ethnographic places, or built-environment resources, thematic subgroups or districts of such deposits, places, or resources, thematically pertinent biological populations, or mineral or water resources, and broad expanses of the land that physically, visually, and intellectually bind the unique suite of elements for each mosaic. (Ex. 2001, p. 4.3-132.)

The PRGTL includes ethnographic, archaeological, and natural resource elements that potentially contribute to the historical significance. These different elements are articulated above in the subsections on ethnographic and archaeological resources. The DTCCL includes both archaeological and built-environment resource elements that potentially contribute to the historical significance. The record offers no reason to reevaluate the historical significance of the DTCCL, so the Energy Commission's CRHR eligibility determination for the resource in the original decision for the project stands. (Ex. 2001, p. 4.3-133.)

### **Regulatory Context for Cultural Landscape Concept**

Although the term appears to be a straightforward derivative of common speech, the term "cultural landscape" actually denotes a formal type of cultural resource. A cultural landscape consists of a "geographic area, including both natural and cultural resources associated with a historic event, activity or person." The Department of the Interior's Historic Preservation Planning Program, a division of the National Park Service (NPS), has defined four overlapping categories of cultural landscapes: historic designed; historic vernacular; historic site; and ethnographic. Historic designed landscapes are deliberate artistic creations reflecting recognized styles and are often associated with important builders, building trends, or events in the history of the construction of these kinds of landscapes. Historic vernacular landscapes illustrate peoples' values and attitudes towards the land and reflect patterns of settlement, use, and development over time. Historic sites are significant for their associations with important events, activities, and persons. Existing features and conditions are defined and interpreted in terms of what happened there at particular times in the past. Finally, ethnographic landscapes can be spaces rather than things that can be owned. These spaces or places are given meaning through their association with local and regional histories, cultural identities,

beliefs, and behaviors. Ethnographic landscapes can include horizons, unmarked spiritual corridors, and places of connection between the earth's surface and the upper and lower realms. While these kinds of landscapes are often associated with Native Americans, they can be associated with any cultural group or belief system. Cultural landscapes can be determined eligible and nominated for inclusion on the NRHP as either sites or districts. As such, these landscapes can be unified wholes or groups of discontinuous elements. The California Office of Historic Preservation's Statewide Historic Preservation Plan, 2013-2017, advocates for analyzing archaeological and ethnographic information together in the identification and evaluation phases of Cultural Landscape documentation. Furthermore, the Office of Historic Preservation has specifically called out a need for cultural resource professionals working on renewable energy projects to shift focus from the site level to the landscape level of assessment. The use of the term "cultural landscape" in relation to both the PTNCL and the DTCCCL reflects these historic preservation concepts, which are applicable to the CRHR and to the analysis of historical resources under CEQA. (Ex. 2001, p. 4.3-133.)

### **Prehistoric Trails Network Cultural Landscape**

The Energy Commission has designated a noncontiguous cultural landscape (a.k.a. "historic district") that incorporates prehistoric archaeological sites associated with the Halchidhoma Trail (CA-RIV-0053T), referred to here as the Prehistoric Trails Network Cultural Landscape (PTNCL). This landscape consists of important destinations in the Colorado Desert near Blythe, California, the network of trails that tie them together, and the features and sites associated with the trails. The foundation of this cultural landscape is a core group of 224 sites. (Ex. 2001, p. 4.3-134.)

The Halchidhoma Trail (CA-RIV-0053T) curves around the southern and western side of the McCoy Mountains leading from the Blythe Intaligos (geoglyphs) through the Chuckwalla Valley. There are 224 trail-associated sites and subsidiary trails associated with the Halchidhoma Trail. (Ex. 2001, p. 4.3-134.)

Energy Commission Staff defines the period of significance as the entire prehistoric and early historic periods. The thematic associations currently include travel, trade, and ritual. Resource exploitation, particularly the collection of stone tool and ground stone raw materials, is also an important theme. The PTNCL site types are divided into three categories: destinations; trails; and trail-associated sites or features. (Ex. 2001, p. 4.3-134.)

The Energy Commission determined that the PTNCL is eligible for listing on the NRHP under Criteria A and D and for the CRHR under Criteria 1 and 4. Native American groups in the Mojave Desert consistently imbue originating and continuance importance to springs, petroglyph sites, and particularly trail systems. Trails across the desert mark

the locations of travels of ancestral groups as they migrated to the confluence of the Gila and Colorado Rivers. Trails also facilitate dream travel to these places and the times when events mentioned in story and song occurred. The particular trail that forms the backbone for this cultural landscape, the Halchidhoma Trail (CA-RIV-0053T), is well known from multiple historical and ethnographic sources. It was an essential trade, transportation, and ritual route for Native American peoples and early European visitors in the Colorado Desert during prehistoric and historic times. (Ca 1700 – 1825.) This route was an essential connection between the Pacific Coast and the Southwestern deserts of Arizona and New Mexico. (Ex. 2001, p. 4.3-135.)

Energy Commission Staff considers the resources that make up the PTNCL to be significant under NRHP Criterion A (CRHR Criterion 1), for their ties to important events in American history. However, most property types associated with the PTNCL exist today as archaeological resources, such as petroglyphs, pot drops, cleared circles, and webs of intersecting trails. These sites are also considered register-eligible under Criterion D/4 for their ability to yield information important in history and prehistory. (Ex. 2001, p. 4.3-135.)

### **Pacific to Rio Grande Trails Landscape (PRGTL)**

The overarching themes of the PRGTL are those of origins and destinations, communication, transportation, trade and warfare, in essence the migration and movement, but also stability, by which indigenous cultures were at least partially shaped during the prehistoric past. This theme reflects the building blocks by which a culture or cultures entered into a state of stasis or flux as groups of people responded to fluctuating natural and cultural environments. Humans are unique in their ability to adapt to myriad environments. The catalysts for initiating population migrations are resource utilization and depletion, population growth and subsequent pressures (on one another and the resources), and the corollaries of kinship, technology, commerce, and warfare, thereby changing groups' (and corollary sub-groups') statuses from stasis to flux and vice-versa. Moreover, prehistoric migration patterns often happen on small incremental scales relative to land masses such as continents, which is to say that prehistoric groups seldom migrate noticeably long distances within the lifetime of an individual, but over tens to hundreds of generations' migration patterns emerge. With the exception of the Thule (Inuit) migration that covered 2000 miles of arctic tundra in approximately 7.5 generations (150 years), most early new world migrations took 115 generations (500 years) to travel several thousand miles. At a macro scale, scientific methods reveal long migratory trails across large bodies of land and water over great spans of time. At a micro scale, trail systems appear as webbed networks that encircle an, or several, environment(s), and bind such areas into a "homeland." Neighboring networks overlap

with one another, and in some places longer macro-migration routes course through overlapping micro-homelands. (Ex. 2001, p. 4.3-136.)

There are three major travel corridors in the PRGTL and these continue to be major travel corridors today. Interstate highways now overlay all three. The trail corridor in the Chuckwalla Valley portion of the PRGTL follows the same route as the I-10 corridor between Los Angeles and Phoenix. It is the closest corridor to the PSEGS PAA. After heading in a northeast direction out of the Los Angeles Basin, the central of the three PRGTLs heads east passing through the Pomona and San Bernardino Valleys before narrowing as it enters the San Gorgonio Pass into the Coachella Valley. The trail corridor heads east out of the Coachella Valley, paralleling the last few of the Transverse Range Mountains. The trail corridor then enters the Chuckwalla Valley where it branches out in a number of directions. The main trunk, however, continues to the east toward the Colorado River. The Blythe area provided historically one of the few places along the lower Colorado River that could be more easily crossed. From there, the trail continues east towards the Phoenix Basin and onward to the east across the Colorado Plateau and down into the northern Rio Grande Valley. (Ex. 2001, pp. 4.3-140 – 4.3-141.)

The PRGTL has been used as a migration and movement corridor for at least the last 10,000 years, and probably longer than 15,000 years, although groups using the corridor did not always encounter the same environment over time. The region in which the Chuckwalla Valley sits has likely been a central migration and movement corridor since not long after initial settlement in the New World. Not only does the archaeological evidence allow such an interpretation, but ethnographic evidence confirms this as well. The record establishes that indigenous understandings of their origins are tied directly to the immediate landscape and homeland in which they live. Movement corridors associated with oral traditions in the vicinity of the Chuckwalla Valley include the Xam Kwatcam Trail along the Colorado River, a trail associated with the Yuman speakers' oral traditions, and the Salt Song of the Chemehuevi Tribe. Moreover, there are multiple elements in the Chuckwalla Valley and in the larger Chuckwalla Valley region that contribute to the character and definition of such a trail corridor. (Ex. 2001, pp. 4.3-141 – 4.3-143.)

The most recognizable element of a movement corridor is a trail, or in the case of the Chuckwalla Valley, a system of trails (see **Cultural Resources - Figure 2**). Ethnographic and ethnohistoric maps, as well as literature, historic plat maps, and archaeological site records, show a vast network of trails in the Chuckwalla Valley, several of which pass directly through the PSEGS project area footprint. More importantly, these maps show that there were multiple routes into and out of the valley, but also trails that connected places of importance within the Chuckwalla Valley, such

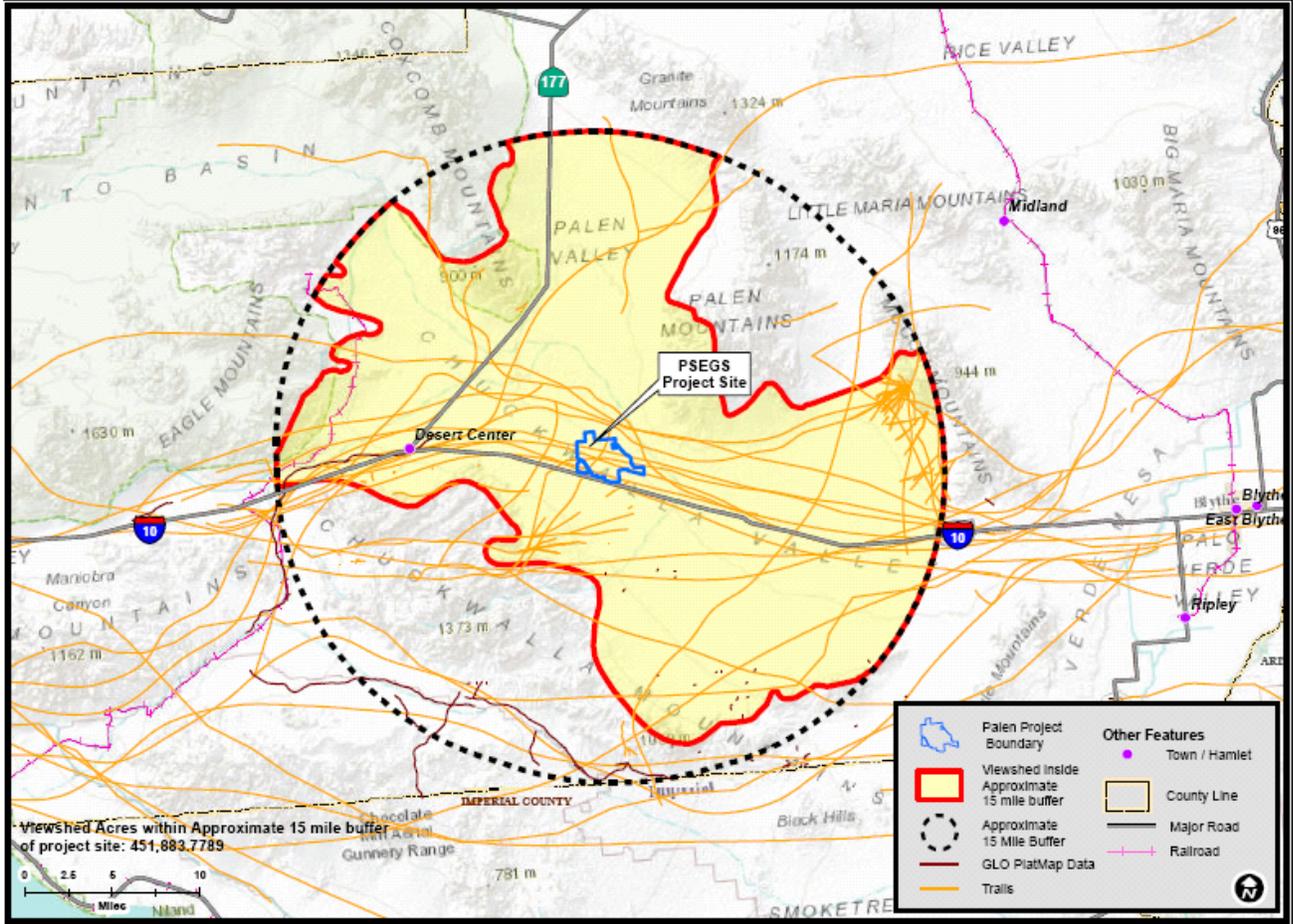
as habitation sites, springs, resource procurement locales, and rock art sites. (Ex. 2001, p. 4.3-143.)

The evidence indicates that migration and movement corridors of the southern California Desert were not restricted to trading and the migration of peoples; these activities also often had a religious and/or cultural component to them. For example, when groups traded they were not only trading physical goods, but language and ideas as well. Trails were also important for warfare, especially in the Colorado River Valley that was the region that experienced the most intense warfare in all of California. For example, what is documented as a single linear path more often in desert environs are several parallel trails that may be explained by attributing each linear trail to a specific ethnic group. These were thoroughfares for intercultural travel as contrasted with intra-cultural travel, similar to how modern freeways often are paralleled by frontage roads for local traffic. This is especially true in the Chuckwalla Valley where the boundaries between tribes often overlap; it is a region on the periphery of several groups' ancestral territories. These separate trails allowed antagonistic groups to avoid each other while travelling through inter-cultural trail corridors. (Ex. 2001, pp. 4.3-143 – 4.3-144.)

Some trails are affiliated with various songs and/or stories sung or told by Native American groups. These are not necessarily physical trails in the sense of an archaeological feature, but in the minds of the groups that ascribe cultural importance to such trails they are just as real. In a similar esoteric vein, the role of dreaming and the trails upon which dreamers travel are especially important resources to Native Americans. Dreaming, the knowledge and methods for proper dreaming, and the revelations resulting from dreaming are thought to be the basis of Lower Colorado Native American lifeways. (Ex. 2001, p. 4.3-144.)

## Cultural Resources - Figure 2

Palen Solar Electric Generating System - Trails of the Chuckwalla Valley Portion of the PRGTL



(Ex. 2001, Cultural Resources - Figure 2.)

There are few, if any, locations within the Chuckwalla Valley where groups stayed for extended periods of time, i.e. permanent year-round occupations. Groups only had to travel about 50 miles to the east or west to reach the Colorado River or the Coachella Valley/Salton Sea locations with ample water and food resources. Therefore, when groups were living in the Chuckwalla Valley their location was primarily determined by access to water and food resources. For example, temporary camps and seasonal residences in the valley appear to have clustered around Palen and Ford Dry Lakes, or the few springs in the area. Other temporary camps in the valley are located in close proximity to important resource locations. There are several known significant resource locations within the Chuckwalla Valley. The NRHP listed North Chuckwalla Mountains Quarry District (CA-RIV-01814), Alligator Rock on the north side of the Chuckwalla Mountains (another source of lithic materials), and dense mesquite dunes at least at the

base of the Coxcomb Mountains at the mouth of Pinto Basin Wash and located adjacent to and within portions of the Palen Dry Lake ACEC. There are likely many unknown regions in the Chuckwalla Valley that were also important resource locations, but there is a dearth of data, especially in the southern Coxcomb, eastern Palen Mountains, portions of the western McCoy Mountains, the northern extent of the Little Chuckwalla Mountains and the Chuckwalla Mountains, and the eastern edges of Eagle Mountain. Moreover, these areas, habitation sites, springs, and plant, animal, and lithic resource locations are all connected with tributary trails. Lifeways in the valley were tethered to the trail network because valley resources were essential to both those who travelled the PRGTL and to those who lived along it. (Ex. 2001, pp. 4.3-144 – 4.3-145.)

Rock art is a fundamental component of the trail network that courses through the Chuckwalla Valley. There are at least 56 recorded rock art sites located within the Chuckwalla Valley. These sites rarely occur in isolation and are often associated with other features of ethnographic and archaeological relevance. There is a positive correlation between habitation deposits, e.g., lithic materials, camps, groundstone or milling features and rock art sites, which some researchers interpret to mean that if these rock art sites “were created during religious or ceremonial activities, these activities were not spatially removed from subsistence activities and residence, and instead were publicly visible social rituals occurring within residential locations.” More importantly for the Chuckwalla Valley, there is an even stronger positive correlation between rock art sites and trails. Most of the rock art sites within the landscape (77 percent) are directly affiliated with a trail segment highlighting the importance of rock art sites to the trail network. Rock art sites also have a positive correlation with springs and tank locations in the valley and, again, trails connect these sources of water and therefore connect all of these important places. (Ex. 2001, pp. 4.3-145.)

The Chuckwalla Valley portion of the PRGTL is significant for three main reasons. One is that this area is the first place (from west to east) where travelers reached a junction of trails providing an opportunity to head north, continue east, or head south; the Chuckwalla Valley was basically a trail junction center for the middle corridor of the PRGTL. This region is also important because of several overlapping tribal claims to the area over time; claims to an area or places within the area, claims to occupation, claims to resource extractions, and claims to the right to thoroughfare. There is some ethnographic, ethnohistoric, and archaeological evidence that several different cultural groups indeed considered the Chuckwalla Valley as their own and thorough petroglyph research in the Valley may bear this out. That is, petroglyphs are often territorial identifiers, and the superimposition of petroglyphs can be indicative of territorial claims and related conversations among groups over both time and space concerning the uses, locations, and meanings of the area. (Ex. 2001, pp. 4.3-146.)

Staff testified that the period of significance for the Chuckwalla Valley portion of the PRGTL spans from time immemorial to at least from the initial peopling of the Pacific Coast from 14,000 years ago to 1936 with the establishment of U.S. Highway 60-70 as a paved highway and prior to the use of a landscape as the Desert Training Center. As noted above, CRIT believes that the period of significance continues to present day. Staff states that during the 1930s the entire landscape was transformed. The Great Depression significantly affected the desire of whites to purchase Indian lands, and Roosevelt appointed John Collier as Commissioner of Indian Affairs. The Indian Reorganization Act passed in 1934 allowed for Indian tribes and individuals to acquire more land and encouraged tribes to adopt a constitution and assert their sovereignty. By the end of the decade, war was on the horizon for the country and General Patton and his troops came into the region soon after. (Ex. 2001, pp. 4.3-149 – 4.3-150.)

Staff notes that Indian trails become Spanish mule train trails that became American wagon trails that became the early rutted road systems that later became paved and driven on by people today, including Native Americans. With the paving of the road, the automobile greatly increased access to and through the Chuckwalla Valley and allowed for a great influx of activity into the Chuckwalla Valley, and particularly, the activities conducted by millions of World War II military personnel preparing for desert battle on the desert training center grounds. The period of significance spans several eras of Native American relations with others and those relations play out along the trails and later roads. (Ex. 2001, p. 4.3-150.)

The boundary of the PRGTL, a cultural landscape that reflects a major trail corridor that connects the Southern California Pacific Coastline to the Northern Rio Grande Valley and includes three prominent trail corridors: the Northern (I-40/I-15) corridor; the Central (I-10) corridor; and the Southern (I-8) corridor. The landscape is bounded on the North (and listed from west to east) by the Santa Barbara Mountains, the Garlock fault line, the Spring Mountains, the Colorado Plateau, and the Northern Rio Grande Valley (Santa Fe, New Mexico). The landscape is bounded on its southern extent by the northern terminus of the Sea of Cortez and the Gila River watershed in its entirety. This broad landscape is uniquely positioned and bounded because it provides the area that most likely and most readily provides the greatest potential for understanding coastal-interior migrations between the two most viable routes for entry, population and settlement of North America, and within which viable indigenous cultures exist that maintain intimate and intact knowledge of origins, migrations, and homeland ecological knowledge. This broad landscape is treated as a thematic context within which the Chuckwalla Valley portion of the cultural landscape is articulated. The Chuckwalla Valley portion of the PRGTL consists of the Chuckwalla Valley/Palen Valley and the surrounding mountains: Eagle Mountains; Coxcomb Mountains; Palen Mountains;

Southern McCoy Mountains; Little Chuckwalla Mountains; and Chuckwalla Mountains; ostensibly the mountain ridgelines within travelers' view as the trail corridor was traversed across and through Chuckwalla Valley. (Ex. 2001, pp. 4.3-150 – 4.3-151.)

Staff identifies the Chuckwalla Valley portion of the PRGTL as a cultural landscape and historical resource under CEQA that has both archaeological and ethrographic contributing elements. The landscape appears to date from a presently undetermined point in prehistory through 1936 and includes archaeological sites and features, traditional cultural properties, a complex trail system, springs, tanks and wells, and culturally important plant and animal species. Applying NPS guidance developed for the NRHP to the consideration of the landscape as a cultural resource under the parallel CRHR, the combination of cultural and natural features that make up this composite resource qualify the resource as a type of cultural landscape. (Ex. 2001, p. 4.3-151.)

The Chuckwalla Valley portion of the PRGTL is ultimately the result of the dynamic interaction between the natural elements of the landscape and the movement of the different Native American cultures that lived and passed through the region. The tangible extant evidence of this interplay are the landscape characteristics that are a part of its formal definition. Of the 11 landscape characteristics described above, the proposed landscape has the potential to possess all of them: land uses and activities; patterns of spatial organization; response to the natural environment; cultural traditions; circulation networks; boundary demarcations; vegetation related to land use; buildings; structures and objects; clusters; archaeological sites; and small-scale elements. These characteristics reflect and articulate the reciprocal manner in which the land has shaped Native American cultures and, in turn, the manner in which successive and overlapping Native American cultures shaped the land through time. (Ex. 2001, p. 4.3-152.)

**Cultural Resources - Table 3**  
**Inventory of Contributing Elements for the Chuckwalla Valley Portion of the**  
**Pacific to Rio Grande Trails Landscape**

<b>Element Name</b>	<b>Location Relative to Facility Site</b>	<b>Character of Element</b>
Palen Mountains Resource Area	Northeast, East	Archaeological deposits, potential natural resources,
Palen Dry Lake ACEC	North	Archaeological deposits, potential natural resources,
Coxcomb Mountains Resource Area	North	Archaeological deposits, potential natural resources,
Coxcomb Fringe Mesquite Area	North	Archaeological deposits, potential natural resources,
Eagle Mountains Resource Area	West	Archaeological deposits, petroglyphs, potential natural resources,
Raceway Mesquite Area	Northwest	Archaeological deposits, potential natural resources,
Chuckwalla Mountains Resource Area	Southwest, South, Southeast	Archaeological deposits, petroglyphs, potential natural resources,
McCoy Mountains Resource Area	East	Archaeological deposits, potential natural resources,
Inter-resource Area Archaeological Deposits	None presently known	Archaeological deposits,
Palen Dunes/Palen Lake TCP	North	Archaeological deposits, trails, potential natural resources, possible cremations
Ford Dry Lake TCP	East	Archaeological deposits,

Element Name	Location Relative to Facility Site	Character of Element
		trails, possible cremations, potential natural resources
McCoy Spring TCP	Northeast	Archaeological deposits, petroglyphs, trails, cleared circles, rock rings, water, potential natural resources
Chuckwalla Spring TCP	South	Archaeological deposits, trails, potential petroglyphs, cleared circles, water, potential natural resources
Corn Spring TCP	Southwest	Archaeological deposits, trails, petroglyphs, cleared circles, rock rings, water, potential natural resources
North Chuckwalla Mountains Petroglyph District TCP	West	Archaeological deposits, petroglyphs, cleared circles, rock rings, trails
North Chuckwalla Mountains Prehistoric Quarry District TCP	West	Archaeological deposits, potential natural resources
Long Tank TCP	West	Trails, water, potential natural resources
Alligator Rock TCP	West	Archaeological deposits, rock rings, trails, potential natural resources
Dragon Wash TCP	West	Archaeological deposits, trails, petroglyphs, potential natural resources
San Pascual Well TCP	North	Trails, water, potential

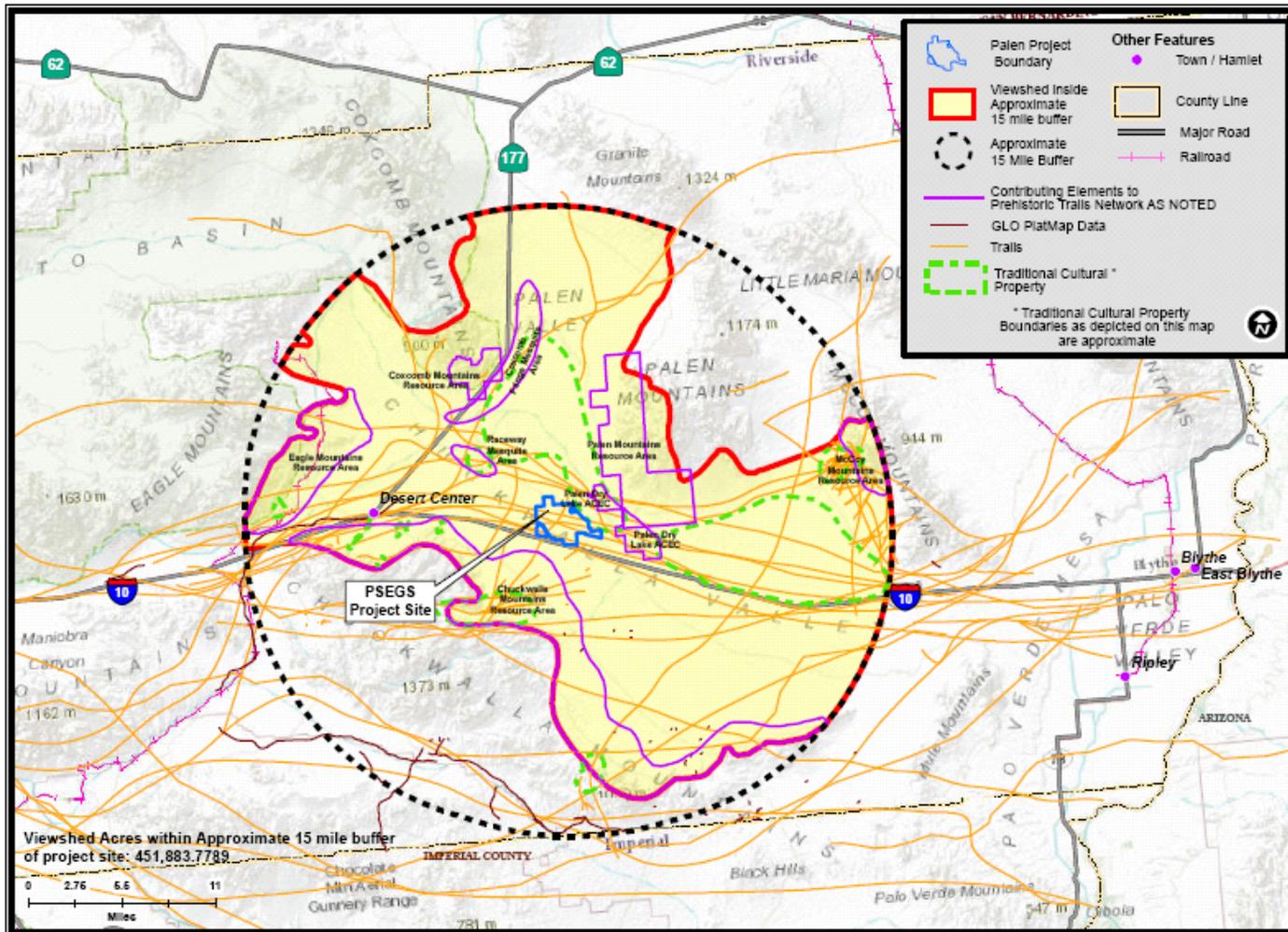
Element Name	Location Relative to Facility Site	Character of Element
		natural resources

(Ex. 2001, p. 4.3-152 – 4.3-153.)

**Cultural Resources - Figure 3** visually depicts the inventory of contributing elements to the Chuckwalla portion of the PRGTL. (Ex. 2001, p. 4.3-152 – 4.3-153.)

### Cultural Resources - Figure 3

Palen Solar Electric Generating System - Archaeological Areas, Trails and other Contributing Elements to the Chuckwalla Valley portion of the PRGTL



(Ex. 2001, Cultural Resources - Figure 3.)

## **Evaluation of the Chuckwalla Valley Portion of the PRGTL Cultural Landscape**

Staff testified that this Landscape is eligible under Criterion 1 at the regional level for its broad contributions to the unique historic events that shaped Native American understanding of the landscape and movement through the landscape, including their ongoing traditions and history that have allowed them to survive and, at particular periods of their existence, flourish in a place that many non-Native Americans would consider inhospitable. (Ex. 2001, p. 4.3-153.) Staff's conclusions were supported by testimony of their Native American expert (Quechan), as well as Chemehuevi and Mojave experts called by CRIT. (Ex. 8026, 10/28/13 RT 58:2-61:19; 91:2397:13.)

The PRGTL landscape is also eligible under Criterion 3 at the regional level for its contributions to the collection of petroglyphs in the region, without which the high artistic value of these sites would be lost. Petroglyphs were created for unknown purposes by unnamed artists, yet continue to convey a host of sentiments to both Native Americans and non-Native Americans, albeit very different sentiments. Moreover, petroglyphs retain a high degree of artistic value because of their place within a larger natural setting which influences the manner in which one understands the art. (Ex. 2001, p. 4.3-154.)

The landscape is also eligible under Criterion 4 at both the local and regional level of significance for the potential to yield archaeological and ethnographic information important to the prehistory and history of the Chuckwalla Valley, and the PRGTL more generally. (Ex. 2001, p. 4.3-154.)

The Chuckwalla Valley portion of the PRGTL maintains the aspects of integrity of setting, integrity of feeling, and integrity of association. Staff described how the integrity of setting, feeling, and association are preserved within the specific criteria for which the landscape is eligible. (Ex. 2001, p. 4.3-154; 10/28/13 RT 45:19 – 52:6.)

Staff testified that the Criteria 1 integrity of setting applies to Criterion 1 because the physical character of the area in which the unique historic events that shaped Native American understanding of the landscape and movement through the landscape is still relatively pristine. Staff and CRIT argue that if the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of setting to convey these unique historic events. (Ex. 2001, p. 4.3-154; 10/28/13 RT 59:24 – 60:5; 93:24 - 97:13.)

Staff testified that the integrity of feeling applies to this criterion because the physical features taken together that are associated with and help to convey the unique historic events that shaped Native American understanding of the landscape and movement through the landscape are still relatively pristine. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of feeling to convey

these unique historic events. (Exs. 2000, p. 4.3-154; 8026; 10/28/13 RT 59:24 – 60:5; 93:24 -97:13.)

Staff testified that the integrity of association applies to this criterion because the landscape as defined is the place where the unique historic events that shaped Native American understanding of the landscape and movement through the landscape occurred, and the physical features of the landscape continue to convey the direct link between these events and the historic resource. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of association to convey these unique historic events. (Exs. 2000, p. 4.3-155; 8026; 10/28/13 RT 59:24 – 60:5; 93:24 -97:13.)

Staff testified that the integrity of setting applies to Criterion 3 because the physical character of the petroglyph sites in the area is still relatively pristine; however, these impacts to the integrity of setting are nominal to the overall sense of setting the high artistic values at the petroglyph sites in the landscape they convey. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of setting to convey these high artistic values. (Exs. 2000, pp. 4.3-155 – 4.3-156; 8026; 10/28/13 RT 59:24 – 60:5; 93:24 -97:13.)

Staff argues the integrity of feeling is applicable to this criterion because the physical features taken together that are associated with the high artistic values of the petroglyph sites remain relatively pristine. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of feeling to convey these high artistic values. (Ex. 2001, p. 4.3-156; 8026; 10/28/13 RT 59:24 – 60:5; 93:24 -97:13.)

Staff argues the integrity of association is applicable to this criterion because the locations where one finds petroglyphs within the landscape are the same exact places where this high artistic endeavor was carried out during prehistory, and the physical features of the landscape continue to convey the direct link between these events and the historic resource. If the PSEGS solar power towers were constructed, the landscape would no longer retain the integrity of association to convey these high artistic values. (Ex. 2001, p. 4.3-156; 8026; 10/28/13 RT 59:24 – 60:5; 93:24 -97:13.)

Staff states that, under Criteria 4, aspects of integrity, setting, feeling, and association are not applicable to this criterion. That is, the ability of the landscape to potentially provide information important to local and regional history is not affected by the integrity of setting, feeling, and association of the landscape. (Ex. 2001, p. 4.3-156.)

Petitioner agrees with Staff that the threshold of significance for evaluating an impact is whether the proposed action has an effect so substantial to destroy the integrity of the characteristic for which the resource being evaluated can be potentially listed. But Petitioner claims that for an evaluation of the PSEGS' increased visibility on the integrity

of the PRGTL, the analysis should include all the other industrial visible sources that exist today as well as the approved project. (Ex. 1077, p. 36.)

In their Opening Testimony, Petitioner's experts testified:

To meet the eligibility requirements for the California Register of Historical Resources, a site must meet one of four criteria. Staff considers two of these criteria which have been met will be impacted by the PSEGS project. Staff argues that feeling and association, for Criterion 1, would be affected whereby the landscape could no longer convey unique historic events. Staff argues that setting, for Criterion 3, would be affected for petroglyph sites. Petroglyph sites tend to be located near springs and washes. However, the solar towers are not visible from some if not most of the petroglyph panels at Corn Springs, most of McCoy Springs and parts of Dragon Wash. A visitor to these petroglyph sites tends to look at the petroglyphs themselves, not the viewshed or the horizon. As a result, the experience at the petroglyphs is not affected by the solar towers, especially for Big Wash and Dragon Wash (KOP 7 and KOP 8) which fall into the seldom seen range. KOP 7, Big Wash, is a mile or two closer than McCoy Springs, so it is likely McCoy Springs is also in the seldom seen category. (Ex. 1077, p. 38.)

Therefore, we request the Commission reject Staff's impact analysis and instead find that the PSEGS would result in similar cumulative impacts to cultural resources as the Approved Project, and in the Visual Resources section find that the PSEGS will result in significant and unmitigatable impacts to Visual Resources, a similar finding to the Approved Project. (Ex. 1077, p. 38.)

Staff counters that "the project owner's position, as we understand it, is the PSEGS would only result in similar cumulative effects to the licensed project...." We disagree. We believe that Palen SEGS would result in a dramatic intensification of the direct visual effects. (10/28/13 RT 52:9 – 52:16.)

### **Desert Training Center California-Arizona Maneuver Area Cultural Landscape**

In the PSPP Decision, the Energy Commission determined that the Desert Training Center Cultural Landscape (DTCCL) is eligible for listing on the NRHP under Criteria A and Criteria D (CRHR Criteria 1 and 4). General Patton's World War II Desert Training Center California-Arizona Maneuver Area (DTC/C-AMA) was the largest and the only such military training facility in American military history. The training that took place here undoubtedly helped to win World War II. Most property types associated with the DTC/C-AMA, across the full extent of the resource, exist today as archaeological resources, such as refuse deposits, tank tracks, foxholes, and bivouacs. These sites have the potential to be primarily eligible under NRHP Criterion D (CRHR Criterion 4) for their ability to yield information important in history. Other property types such as the

airfields, camps, and hospitals are potentially eligible for listing under Criterion A (CRHR Criterion 1). (Ex. 2001, p. 4.3-157.)

The DTCCL is a vast resource extending well beyond the original archaeological PAA. At present count there are approximately 36 potential contributors within the project site that need to be confirmed as clearly associated with the DTCCL, the corral (SMP-H-2016) and 35 can scatters (some with associated tank tracks). These sites are expected to be subject to direct impacts from the PSEGS. The PSPP Decision determined that impacts to them, if unavoidable, would be mitigated by data recovery. The PSEGS will contribute to a cumulative impact to numerous other resources in the vicinity that will be subject to direct impacts as future projects are approved, including, but not limited to, Desert Center Airfield, Camp Desert Center, Observers Camp, 36 Evacuation Hospital, and Ordnance Depot.

## **CONCLUSIONS REGARDING PSEGS' IMPACTS TO INDIVIDUAL CULTURAL LANDSCAPES AND MITIGATION**

### **Pacific to Rio Grande Trails Landscape (PRGTL)**

We agree with Staff, Californians for Renewable Energy, and CRIT that the presence of the PSEGS facility's two heliostat fields, and particularly the two approximately 750-foot-tall solar power towers, would introduce stark visual intrusions on the landscape that would profoundly and irreparably degrade the ability of the landscape to convey its historical significance under CRHR Criterion 1. (Exs. 2000, pp. 4.3-158 – 43.-159; 5000, pp. 4-5; CRIT Opening Brief, p. 5.) The mass of the towers in combination with the operational glare of the solar receiver steam generators atop each tower and the bright haze of the operational solar flux field, would compromise the setting, feeling, and association aspects of the Chuckwalla Valley portion of the PRGTL's integrity, aspects critical to the resource's ability to convey its associative values under Criterion 1. The adoption of the Reduced Acreage Alternative reduces the impacts to the Chuckwalla Valley, but does not eliminate it.

The great weight of the evidence convinces us that, subsequent to the construction of the facility, one would no longer be able to experience the sense of the landscape as it was during its period of significance. As Staff points out, the baseline presence of the I-10 and State Route 177 corridors, the community of Desert Center, the Desert Sunlight Solar Farm, and the Genesis Solar Energy Project have contributed to the visual degradation of the landscape. The character of Chuckwalla Valley, however, attenuates this degradation. According to Staff, the broad, low-angle sweep of the valley tends to mask these roads and structures, and helps preserve the sense of its remote and natural essence. The presence of the solar power towers would significantly intrude on the broad, relatively undisturbed expanses of the balance of the landscape. Staff

testified that the towers would loom large over the valley floor nearer the facility site, while the solar receiver steam generators, when online, would hover brilliantly high in the air imposing their environmentally incongruous and intrusive character far across the valley. We find that the imposition of these two glowing towers would dominate the Chuckwalla Valley. We find that the construction and operation of the PSEGS project would result in a significant impact on the Chuckwalla Valley portion of the PRGTL, a historical resource, and would require mitigation under CEQA. (Ex. 2001, pp. 4.3-158 – 43.-159.)

We further agree with Staff and CRIT that the significant effect of the PSEGS project on the Chuckwalla Valley portion of the PRGTL is not mitigable. The record contains no evidence of any feasible way to mask the visual predominance of the towers or the solar receiver steam generators. We are also unaware of any mitigation measures that would reduce the loss of an entire landscape or a significant portion of one to a less-than-significant level. To substantively reduce the visual overreach of the PSEGS project on the Chuckwalla Valley portion of the PRGTL to a less-than-significant level, the project owner would need to provide for compensatory mitigation that attenuates the magnitude of the project's visual effects on the subject portion of the landscape over the entire span of time that the PSEGS facility would remain in the valley.

Staff suggests that it is possible to devise feasible suites of mitigations to meaningfully reduce the PSEGS visual effects. Staff still maintains that the PSEGS project's effects on the Chuckwalla Valley portion of the PRGTL would be significant even with recommended mitigation. Staff proposes a suite of compensatory mitigation through Condition of Certification **CUL-1** that, while not reducing the PSEGS project's effects to a less-than-significant level, would serve to ameliorate the loss of the Chuckwalla Valley portion of the PRGTL's ability to convey its associative values. (Ex. 2001, p. 4.3-159.)

Staff argues that the requirement of surveys would partially compensate the public for the degradation of this portion of the PRGTL through the recordation of samples of the presently known archaeological deposits and ethnographic places within the landscape. The primary effort to more thoroughly and definitively describe the resource would be augmented through the execution of a petroglyph study and a paleoenvironmental study. Staff recommends requiring the project owner to contribute to revising both the draft context and the draft field manual of the PTNCL to further describe and interpret the Chuckwalla Valley portion of the PRGTL. Staff recommends several different public outreach initiatives in Condition of Certification **CUL-1** that would provide the general public and interested Native American communities intellectual access to the Chuckwalla Valley portion of the PRGTL. These initiatives include the production and distribution of a video or other internet content to interpret the landscape for the general public, and programs that interested Native American communities develop and

administer. Staff describes the public outreach initiatives as “the consumer products that, to whatever extent they can, would compensate both the general public and the Native American public for their respective losses of their respective potential experiences of the associative values that the Chuckwalla Valley portion of the PRGTL would have offered.” (Ex. 2001, pp. 4.3-160 – 4.3-161.)

Petitioner initially argued that Condition of Certification **CUL-1** would be burdensome requiring uncapped mitigation and millions of dollars worth of unwarranted surveying. Petitioner contended that the “uncapped financial obligations are not only unfinanceable, but indefensible when the Commission is asked what relation the mitigation bears to the impact. Staff fails to provide any nexus between the impacts claimed and the mitigation required. In fact, Staff is clear that even with the mitigation imposed by **CUL-1**, the impacts are immitigable.” (Ex. 1076, pp. 38-39.)

At the October 28, 2013 evidentiary hearing, Petitioner’s expert testified that the list of actions in Condition of Certification **CUL-1** was burdensome except for two, namely the reconnaissance survey proposed for the Palen and Coxcomb Mountains, and the \$35-an-acre for cumulative effects to the landscape. (10/28/13 RT 75:17-20.) Otherwise, the other actions of Condition of Certification **CUL-1** were “asking too much.” (10/28/13 RT 76:9-13.)

Intervenor CRIT initially objected to the Petitioner’s request that we reject proposed Condition of Certification **CUL-1** because the PSEGS project has similar impacts to the PSPP project. As outlined in CRIT’s opening testimony, the PSEGS project has significantly greater impacts on cultural resources due to its visual presence. CRIT argued that the Condition of Certification **CUL-1** surveys should have been completed as analysis of project impacts, rather than as after-the-fact mitigation. CRIT stated that it would not oppose a reasonable cap on the financial obligations required as part of Condition of Certification **CUL-1**, and proposes that such a cap be tied to either an estimate of the potential costs or a percentage of expected project revenue. (Ex. 8027; pp. 1-2; Ex.8028, p. 4.)

The December 13, 2013 Presiding Member’s Proposed Decision (PMPD) (TN 201434) included Staff’s recommended Condition of Certification **CUL-1** as originally proposed, but acknowledged that Condition of Certification **CUL-1** was “imperfect and could benefit from more limiting language to provide certainty of the project owner’s obligations.” (PMPD, p. 6.3-53.) Although the PMPD recommended denial of the Petition to Amend the PSEGS project, the denial was without prejudice. The PMPD admonished the parties to work together to fine-tune the language of Condition of Certification **CUL-1** to establish reasonable limits and correct any other deficiencies in the event that the matter was reopened. (PMPD, p. 6.3-54.)

After Petitioner's Motion to Reopen the Evidentiary Record was granted (TN 202362), Staff introduced its Supplemental Staff Assessment and Testimony (Ex. 2017) to explain its recommended funding increases, as well as to address CRIT's objections and explain the nexus between the impacts to the Pacific to Rio Grande Trails Landscape and the mitigation contained in its revised Condition of Certification **CUL-1**. Staff's supplemental testimony includes a list of the 15 tribes affiliated with the Chuckwalla Valley. (Ex. 2017, p. 25.)

Staff's testimony referred to a cultural resources workshop in April 2014 that addressed Staff's proposed revised Condition of Certification **CUL-1**. The revised Condition of Certification **CUL-1** reflected a renewed round of tribal consultation invitations, a review of the Genesis Solar Energy Project (GSEP) Tribal Working Group forum in order to better understand the advantages and disadvantages of a proposed Native American Advisory Group, and an exploration with those tribes that responded to an Energy Commission renewed invitation to consult on Condition of Certification **CUL-1** concerning the suite of concepts that might best address their cultural and spiritual perpetuation impacts. Staff's revised Condition of Certification **CUL-1** also included a recalculation of the proposed study costs and reflected discussions with the BLM Palm Springs Field Office regarding the sufficiency of the mitigation. (Ex. 2017, pp. 26-29).

Staff's revised Condition of Certification **CUL-1** created a distinction between cultural resource impacts to "place interests" and "tribal people interests."

### **Place Interest**

According to Staff, place interests derive from the significance criteria by which the landscape was found eligible under state historic preservation law (Pub. Resources Code, § 5024.1(c)). The four significance criteria are: A) events that contribute to the broad patterns of California history and cultural heritage (i.e. migration and origins); B) is associated with the lives of persons important in our past; C) possesses high artistic values (i.e. petroglyphs); and D) yields information important in prehistory (relation between prehistoric/proto-historic habitation, travel and resource extraction, and procurement). Staff's original analysis in the FSA (Ex. 2000) found criteria A, C and D applicable to the Chuckwalla Valley portion of the PRGTL, but could not find association with a specific person or persons important to California's past. The PMPD determined that the Chuckwalla Valley portion of the PRGTL presently retains degrees of integrity (setting, feeling, and association) sufficient to convey the significance of each of these values. The impact of the project on the landscape and the associative, artistic, and information values it conveys would lessen the ability of the landscape to convey its significance to the people of the State of California. As the significance of the landscape is reduced because of the construction and operation of an energy facility, so also is the opportunity of the people of the State of California to experience the landscape and the

significant historic meanings that it conveys. This is what Staff identified as the “state” or “place” interest.

Therefore, Staff proposed that the originally proposed mitigation measures remain unchanged, but separated in Condition of Certification **CUL-1A** with the intent to capture that loss of significance through conducting a number of studies to thoroughly document the events and broad patterns of history and cultural heritage, the artistic values of the petroglyphs of the Chuckwalla Valley, and the paleo-environmental scientific baseline of the Chuckwalla Valley. Staff then proposed that, upon completion of these studies that would be screened for issues of confidentiality, the salient findings would be conveyed to the public in video and other readily consumable media. (Ex. 2017, p. 33.)

### **Tribal People Interest**

Staff differentiated “tribal people interests” from the “state” or “place” interests as the tribal peoples’ current reliance upon the Chuckwalla Valley as a source of nutritional, medicinal, historical, and religious identity. This cultural identity is transmitted generation to generation. The impairment of a landscape diminishes Native American peoples’ ability to perpetuate their cultures. This impairment is disproportionately placed on Native American cultures that have relied, and continue to rely, upon the Chuckwalla Valley for thousands of years. No other cultures or peoples can claim this specific locale coupled with such a depth in time. Therefore, Staff opined that an impact to the Chuckwalla Valley portion of the PRGTL is an impact to the lived, shared, and perpetuated cultures of the people of the affiliated tribes. (Ex. 2017, pp. 33-34.)

Staff proposed Condition of Certification **CUL-1B** mitigations to compensate for the Native American peoples’ diminished ability to practice and perpetuate their cultures. Staff concedes that while Staff is competent to identify and cost out the proposed place interest mitigations (studies) for Condition of Certification **CUL-1A**, Staff is less able to identify and cost out proposed tribal people interest mitigations simply because Staff is not intimately involved in the living dynamics of the 15 tribal communities, and most tribes do not want to discuss potential mitigation measures. Further, Staff points out those tribal concerns applicable to some tribes may not apply to all affiliated tribes. (Ex. 2017, p. 34.)

Therefore, Staff proposed some general concepts for mitigation of impacts to tribal interests, and focused more on structuring a tribal forum where tribes and agencies can deliberate. Staff proposes general mitigation concepts that are land based (easements and management plans), because the impacts are to a landscape. In addition, Staff has proposed a tribal cultural resources granting program to accommodate tribally-proposed concepts. (Ex. 2017, p. 34.)

Staff testified to the difficulty in determining amounts of monetary mitigation to tribal interests without robust tribal input. Staff can readily calculate the place interest; therefore, if Staff were to assume that the place interest and the tribal people interest are equal or in some way proportional, Staff believes it could then extrapolate the tribal people interest amount from the place interest amount. The Petitioner has determined the mix to be 1/3 to 2/3. (Ex. 2017, p. 34.)

### **Funding Condition of Certification CUL-1**

Staff's revised Condition of Certification **CUL-1** resulted in an increase for place interest studies (Condition of Certification **CUL-1A**) from \$2.46 million to \$3.2 million. Staff added \$150,000 to the Petitioner's proposed \$1.96 million for tribal people interest (Condition of Certification **CUL-1B**), bringing the total for tribal people interest to \$2.11 million for Tribal Advisory Group support and management. This figure, combined with the place interest portion of \$3.2 million, results in a total Staff-proposed Condition of Certification **CUL-1** budget of \$5,313,273 to cover both state and tribal interests. (Ex. 2017, pp. 26 – 27.)

Tables illustrating the specific mitigation items and allocations of Staff's proposed budget figures are provided in **Cultural Resources Tables - 4 and - 5** below. Staff cautions that aspects of Condition of Certification **CUL-1A** that require tribal integration into the study activities in **Cultural Resources - Table 4** are not intended to mitigate for the tribal peoples' interests or values. Rather, tribal integration is meant to ensure that the proposed studies, meant to further understand the cultural landscape that is intricately tied to affiliated tribes' cultures, are conducted in ways that include their perspectives and, therefore, render the study methods and scientific and interpretive findings more valid. (Ex. 2017, p. 27.)

**Cultural Resources - Table 4**

Proposed Mitigation Budget for CUL-1A			
Programs	Cost	Tribal Integration Percentage and Cost of Study	Total
Program Management	\$185,550	10% or \$18,555	\$204,105
Class II Surveys	\$1,370,640	20% or \$274,128	\$1,644,768
Paleoenvironmental Study	\$300,000	15% or \$45,000	\$345,000
Petroglyph Study	\$400,000	40% or \$160,000	\$560,000
PTNCL/PRGTL Context and Field Manual Revision	\$100,000	5% or \$5,000	\$105,000
Public Outreach	\$200,000	5% or \$10,000	\$210,000
Treatment for Cumulative Effects	\$134,400	0%	\$134,400
<b>TOTAL</b>	<b>\$2,690,590</b>	<b>\$512,683</b>	<b>\$3,203,273</b>

(Ex. 2017, p. 28.)

**Cultural Resources - Table 5**

Proposed Mitigation Budget for CUL-1B	
Programs	Costs
Native American Advisory Group Support/ Management	\$150,000
Program Implementation Funds	\$1,960,000
<b>TOTAL</b>	<b>\$2,110,000</b>

(Ex. 2017, p. 28.)

CRIT's evidence supports three main objections to Staff's proposed Condition of Certification **CUL-1**. First, CRIT asserts that although no amount of money will mitigate the harm to Native American cultural interest in the area, the amount of mitigation proposed is still inadequate. (Exs. 8028, pp. 1-2; 8036, p.1.) Second, the formation of a Native American advisory group pits the various tribes against each other, causing unnecessary inter-tribal discord. (Ex. 8028, p. 2.) Third, the Energy Commission has not responded to CRIT's own governmental imperatives relating to consultation and consummation of agreements between the tribes and California state agencies such as the Energy Commission. (Exs. 8028, p. 2; 8036, p.1.)

Petitioner argues that Staff's proposed Condition of Certification **CUL-1** does not cure the deficiencies identified in the PMPD, nor does it address the Native Americans' rejection of the idea of a Native American advisory committee. Specifically, Petitioner points out that Staff's proposed condition fails to integrate tribal participation in the design of measures aimed at mitigating cultural impacts to the Chuckwalla Valley. Petitioner recommends removing the paleo-environmental study and the PTNCL/ PRGTL context and field manual revisions because they neither apply to tribal interests nor provide significant new information about the Chuckwalla Valley. Petitioner would

also recommend deleting the public outreach component while acknowledging that such a mitigation measure would provide a nexus to the impacts. (Ex. 1171, pp. 3-4.)

The Committee directed Staff to broaden its approach to condition **CUL-1** and to explicitly consider both the state interest and the Native American interest. However, the Committee did not intend for Staff to distinguish between place or state interest and tribal interests for purposes of CEQA analysis. (7/29/14 RT 188:4 – 24; 190:8 – 22; 193:20 – 195:3.) They are one and the same. Indeed, at the evidentiary hearings, Staff's expert clearly concurred with this position. (7/29/14 RT 182:15 – 17; 184:15 - 185:1; 186:13-24.) Although Staff's testimony does not consider the PRGTL eligible for listing on the CRHR under Criteria 2, we have received evidence of people associated with the Chuckwalla Valley who are important to the tribal peoples' past. (7/29/14 RT 155:20 – 156:25; 7/30/14 RT 302:2 – 303:22.) We have received uncontroverted evidence that the Native American tribes, including, but not limited to, the Quechan, Mojave, and Chemehuevi, consider the physical, biological, and spiritual experience of the land to be indivisible. They do not separate flora and fauna from other cultural resources in the environment. (7/29/14 RT 152:13-155:7; 163:1 – 22; Ex. 8035, 7/30/14 RT 298:11– 306:25; 309:24 – 310:6; 314:23 – 356:20.) These differences of point of view between native and non-native parties are not irreconcilable, but reconciliation can only be achieved through communication. We agree with CRIT that government-to-government consultations between the California Energy Commission (CEC) and the tribes are essential to effectuating appropriate mitigation. (CRIT 8/15/14 Opening Statement, p.8.) Therefore, we will require the Compliance Project Manager (CPM) to engage in consultations with the tribes associated with the project site.

CRIT has provided ample evidence of barriers to the effectiveness of a Native American Advisory Committee, such as the Genesis Tribal Working Group. Such a tribal advisory group can pit tribes against each other and can be inconsistent with the decision-making process of sovereign tribal governments. There must be government-to-government consultation. (Exs. 8028; 8030; 7/29/14 RT 225:4 – 11; 243: - 244:6.) Obviously, the CPM will need to consult directly and individually with each separate tribe.

The purpose of the CPM's consultations with the tribes listed in Condition of Certification **CUL-1** is to ascertain the priority of mitigation projects that each tribe recommends for implementation to reduce the significant effects of the PSEGS project on cultural resources in the Chuckwalla Valley. Other than the public outreach provision and treatment for cumulative effects described below, the mitigation projects will be determined by the CPM after consultation with the tribes. The record contains various ideas for mitigation projects including reconnaissance pedestrian (class II) surveys at the locations in or around the PSEGS site, Chuckwalla Valley petroglyph studies, conservation easements, cultural resources education grants related to the Chuckwalla

Valley, and grants for vocational training in the conduct of cultural resource surveys, etc. The CPM is not bound by these ideas and may reject any or all of them in favor of other mitigation ideas that arise from tribal consultations.

After the CPM has consulted with all of the listed tribes, the CPM will convene a meeting (or meetings) with all of the tribes to summarize the recommendations the CPM will have received through the consultations with the tribes. The objective of the meeting(s) will be to communicate to the tribes all of the various mitigation ideas so that all of the tribes can consider the types of mitigation that have been proposed. It is possible that some ideas for mitigation would have widespread appeal among the tribes. Further consultations may be required after the meeting(s) to enable the CPM to make an informed decision. Ultimately, the CPM has the duty to oversee mitigation for the project (Cal. Code Regs., tit. 20, §1770), therefore the CPM will have the authority to determine which mitigation measures will be implemented based upon such factors as majority of tribal agreement, nexus between the impact and proposed mitigation and, sufficiency of funding.

We agree with Petitioner that the paleo-environmental study and the PTNCL/PRGTL context and field manual revisions do not apply to tribal interests or provide significant new information about the Chuckwalla Valley and, therefore, we will not include those in Condition of Certification **CUL-1**. However, we disagree with Petitioner's recommendation to delete public outreach. At this time, the best way to preserve the preconstruction experience of the project site for future generations would be through photography or videography. Therefore, we will require a provision of Condition of Certification **CUL-1** requiring that the project owner obtain and provide copyright-free videographic and photographic images of the PSEGS site, including long range, mid range, close range, and aerial views of the site depicting its relationship to the Chuckwalla Valley. The project owner shall establish a website where the general public can obtain copies of the images. As part of the consultation process described above, other public education options may be considered and implemented.

Although we will not impose the suite of conditions recommended by Staff, we find that the range of conditions was reasonable and the projected costs for the proposed conditions were also reasonable. On the other hand, policy favors providing the project owner with a level of certainty as to the actual project mitigation costs. We expect the tribes to offer a commensurate range of mitigation projects with similar funding requirements to those recommended by Staff. Therefore, in order to fund the mitigation projects proposed by the listed tribes, we will cap the costs for these projects at \$3 million.

We recognize the fundamental obligation of "[e]ach public agency [to] mitigate or avoid the significant effects on the environment of projects that it carries out or approves

whenever it is feasible to do so.” (Pub. Resources Code § 21002.2(b); *City of Marina v. Board of Trustees of the California State University* (2006) 39 Cal.4th 341.) The mitigation proposed in Condition of Certification **CUL-1** represents our best efforts at mitigating the PSEGS inmitigable visual impacts on cultural resources that will be disproportionately borne by the tribes. Nevertheless, we find that the PSEGS project will still have a significant impact on cultural resources in the Chuckwalla Valley, even with the implementation of conditions of certification.

Intervenors CRIT and CaRE presented substantial evidence on the tribal connection to the flora and fauna of the project area, particularly birds and insects. While we understand the cultural importance of this connection to the tribes, for purposes of CEQA, impacts to birds and other biological resources are discussed in the **BIOLOGICAL RESOURCES** section of this Decision.

CRIT argues that the deterrent methods used to divert birds, bats and insects from the solar flux field may further impact the cultural landscape of the Chuckwalla Valley. (CRIT 8/15/14 Opening Testimony, p. 16.) As discussed in the **BIOLOGICAL RESOURCES** section of this Decision, the adaptive management methods have yet to be determined and its impacts are also unknown. However, Condition of Certification **BIO-16b** requires the project owner to take all feasible steps to prevent or minimize impacts to the cultural landscape that may arise from the deployment of deterrence measures.

### **Desert Training Center California-Arizona Maneuver Area Cultural Landscape**

The construction of the amended project would cause a substantial adverse change in the significance of the Chuckwalla Valley portion of the Desert Training Center Cultural Landscape (DTCCCL). As discussed above for the PRGTL, the direct visual effects of the amended project due to the change in the project’s solar thermal technology are far greater than those of the licensed project. The conclusions and the conditions of certification (**CUL-2, CUL-13** through **CUL-15**) that relate to the DTCCCL from the original license; that is, conclusions and conditions concerning how the licensed project would physically affect DTCCCL-related historical archaeological deposits on the facility site and the cumulative effects the licensed project would have on those same deposits, remain intact and unchanged because the PSEGS project would have roughly the same direct physical effects to those deposits on the facility site. (Ex. 2001, p. 4.3-161.)

## **CUMULATIVE IMPACTS AND MITIGATION**

The **PROJECT DESCRIPTION** section of the decision identifies the development projects that may contribute to cumulative impacts on cultural resources in combination with the PSEGS amendment. These include the Genesis Solar Power Project (09-AFC-8C) and the Blythe Solar Power Project (09-AFC-6C). These projects are located within a geographic area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects would be required to undergo their own independent environmental review under CEQA. (Ex. 2001, p. 4.3-164.)

Cumulative impacts could occur if impacts resulting from the implementation of the PSEGS project combined with the impacts of other local or regional projects on the same or similar resources. Cumulative impacts would occur locally if the PSEGS impacts combined with the impacts of projects located within the area identified in **Project Description - Figure 5**. Cumulative impacts could also occur as a result of the development of some of the many proposed and licensed solar and wind development projects that have been, or are anticipated to be, constructed in the foreseeable future. This geographic scope is appropriate because it is likely that cultural resources similar to those in the PSEGS PAA are present throughout the Chuckwalla Valley. (Ex. 2001, p. 4.3-164.)

The PSPP Decision determined that there would be a cumulatively considerable impact to cultural resources. Staff testified that the PSEGS project would have greater direct and cumulative impacts than the licensed PSPP project. Therefore, we find the already cumulatively considerable impacts from the PSPP project would be even greater from the PSEGS project. (Ex. 2001, p. 4.3-164.)

### **Project Cumulative Impacts and Mitigation**

The prehistoric archaeological and ethnographic resources that are subject to significant visual degradation from the construction and operation of the PSEGS project are contained within the broad Chuckwalla Valley portion of the PRGTL to Rio Grande Trails Landscape. Many of the historical archaeological resources in the valley are further interwoven into the Desert Training Center Cultural Landscape themes. Given the proliferation of large-scale solar energy projects in the Chuckwalla Valley, we find the PSEGS project's visual dominance would impact at a level that would be cumulatively considerable and largely unmitigable. (Ex. 2001, p. 4.3-165.)

While the cumulative effect of industrialized development within the I-10 corridor with the addition of the PSEGS would continue the degradation of the broader setting and association for the town of Desert Center as a traveler's way-stop in the early 20<sup>th</sup> century, it would not impact the integrity of that historic resource unless there were

project features that disturbed the integrity of the spatial relationships (location), materials, workmanship, and design of the core structures considered potentially-eligible as a historic district. Cumulative effects on the Eagle Mountain Railroad would only have an impact on the railroad if a project would require removal of portions of the rail line. The same can be concluded for the Colorado River Aqueduct and the Eagle Mountain Pumping Plant, both of which are unlikely to be affected by the cumulative impacts from development in the Chuckwalla Valley. Therefore, we find that it is unlikely that built-environment resources would suffer significant impacts from the cumulative industrial development in the I-10 corridor and the Chuckwalla Valley. (Ex. 2001, p. 4.3-166.)

We have concluded that the approval of the amended project would result in cumulatively considerable and unmitigable impacts principally to the Chuckwalla Valley portion of the PRGTL and the DTCCCL, among other potential individual cultural resources. Both Petitioner and Staff have offered the same mitigation for the cumulative effects of the project, and the proposed mitigation was not disputed. The amount of the contribution shall be \$35.00 per acre that the project encloses or otherwise disturbs. We find that the compensatory mitigations that have been developed here for the direct visual impacts of the amended project to these resources, in combination with the mitigations developed for the former PTNCL (now subsumed within the PRGTL) and the DTCCCL in the original licensing case, are together sufficient to also function as reasonable attempts to mitigate for the largely unmitigable cumulative impacts of the amended project's visual presence on historical resources and affiliated Indian tribe environmental justice populations. (Ex. 2001, p. 4.3-166.)

### **Native American Environmental Justice**

Federal Environmental Justice (EJ) guidance directs agencies to consider, to the extent practicable, whether there is or will be an impact on the natural or physical environment that significantly and adversely affects Native American tribes. Such effects may include ecological, cultural or social impacts on Native American tribes when those impacts are interrelated to impacts to the natural or physical environment. Agencies must also consider whether environmental effects are significant and are or may be having an adverse impact on Native American tribes that appreciably exceeds or is likely to appreciably exceed those on the general population or other appropriate comparison group.

Staff testified that the Native American tribes affiliated to the Chuckwalla Valley (through ancestral or traditional use claims) constitute environmental justice populations. Staff, Californians for Renewable Energy, and CRIT contend that Native American tribes maintain long-standing ancestral and traditional practices that connect their identities as Indian people to the environment, unlike other populations that do not have territories

linked to their collective identities. We find that the PSEGS project's direct and cumulative impacts to cultural resources are borne disproportionately by Native Americans.

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant LORS are contained in **Appendix A** of this decision. Construction and operation of the PSEGS project with the implementation of the **CULTURAL RESOURCES** conditions, below, will comply with all applicable LORS regarding long-term and short-term project impacts in the area of cultural resources. Conditions of Certification **CUL-1** and **CUL-2** reduce the project's direct and cumulative impacts to the greatest extent possible, but those impacts would not be reduced to a less-than-significant level. Condition of Certification **CUL-3** through Condition of Certification **CUL-10** remain adequate to mitigate potential inadvertent direct physical impacts that could result from the construction of the amended project. Conditions of Certification **CUL-11** through **CUL-15** still reduce direct physical impacts to historical resources on the facility site to a less-than- significant level. (Ex. 2001, p. 4.3-166.) Finally, with regard to environmental justice, although there appears to be no law on point, there are a suite of federal policies such as the EPA's 1998 EJ Guidance, Executive Order #12898 of 1994, and title VI of the 1964 Civil Rights Act that would constitute a standard for purposes of LORS analysis. We find that the PSEGS would not conform to this standard as applied to Native Americans suffering disproportionately from the project's impacts to cultural resources.

CRIT argues that the Commission must consider whether the project conforms to the National Environmental Policy Act, the National Historic Preservation Act, the Federal Land Policy and Management Act, the American Indian Religious Freedom Act, and Executive Order No. 13007, among other regulations and standards. (CRIT Opening Brief, p. 23.) All of the laws CRIT refers to are federal. Since the project is located entirely on federal land, the BLM would be responsible for the enforcement of the applicable federal LORS in its parallel proceedings. We have relied upon Energy Commission staff to provide the list of applicable LORS contained in **Appendix A** of this Decision. Pursuant to Cal. Code Regs., title 20, § 1748(e), CRIT would have to make a reasonable showing to support the need for inclusion of these provisions as they would relate to the proposed facility. No such showing has been made.

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether

the change in the project will be beneficial to the public, Applicant, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

The PSEGS project is likely to disturb fewer buried cultural resources than the PSPP due to the substantial reduction in grading in the amended project.

## **PUBLIC COMMENT**

On October 28, 2013, **Irene Kingery**, a member of the Quechen tribe who serves as the site preservation officer, addressed the failure of the tribe to participate in the consultation process. She also spoke about the use of the PSEGS site for funeral ceremonies; that it was a place that the dead pass through so it should not be obstructed. Ms. Kingery also mentioned that there were problems at the Genesis project site where artifacts were being washed away and insensitively handled.

**Linda Otero** of the Mohave Indian Tribe discussed multiple issues regarding the use of the site by Native Americans, including the animals, who historically gave names to her tribe members on October 28, 2013. She also talked about the interconnectedness of the resources at the site: water; petroglyphs; and mountain ranges and their impact on the Mohave people.

**Manfred Scott** from the Quechan tribe spoke on October 28, 2013. He questioned the expertise of one of the applicant's witnesses because of her involvement in an incident where native remains and artifacts were improperly handled. He spoke about the history of the Quechan tribe in the area and how to this day it is possible to remember what it was like for his ancestors. PSEGS would negatively impact that.

On February 13, 2014, **Joseph Ontiveros** of the Soboba Band of Luiseno Indians and **Patricia Garcia-Tuck** of the Agua Caliente Band of Cahuilla Indians responded in the affirmative to Staff's request for consultation, and on February 28, 2014, **Dennis Patch** of the Colorado River Indian Tribes also responded in the affirmative to Staff's request for consultation.

On March 21, 2014, **Joseph Ontiveros** of the Soboba Band of Luiseno Indians commented on the language of several cultural conditions of certification, mostly calling for deeper tribal involvement in monitoring and mitigation.

On April 23, 2014, **Kenneth B. Waxlax** commented that the land under the proposed Palen project is owned by the U.S. Taxpayers. The Bureau of Indian Affairs appears to hold title to 212,000 acres in the area between Blythe and Desert Center. That totals 488,679 acres, or 763 square miles. The Palen project is about 3,800 acres or less than 1 percent of that total and is not located on reservation or BIA land.

**Andrea Compton** of the National Park Service commented, on April 7, 2014, regarding her concerns regarding impacts to cultural resources. She recommends regular consultations with the State Historic Preservation Office and Tribal Historic Preservation Officers.

At the July 29, 2014 evidentiary hearing, **Edward Smith**, Chairman of the Chemehuevi Indian Tribe, commented about the history of the Chemehuevi reservation at Lake Havasu and the Diaspora of the Chemehuevi after Parker Dam was built. He remarked that their religion is still alive and their songs are tied to the landscape. He favors renewable energy.

**Joseph Ontiveros**, Cultural Resource Director of the Soboba Band of Luiseno Indians, commented, at the July 29, 2014 evidentiary hearing, that the PSEGS site is located along the traditional bird song trail. The site would be visible from Mt. San Jacinto, which is a sacred mountain. He criticized the Genesis project's mishandling of sensitive cultural resources. He affirmed that for tribal people, the land, the people, and biological resources are all integrated and indivisible. He recommended consultations with the tribe.

**Johnson Fisher** from CRIT commented, at the July 29, 2014 evidentiary hearing, that the land was priceless and must be protected. To try to divide the tribes with money for land is insulting. He recommended consultations with the tribes.

**Linda Otero** of the Mohave Indian Tribe commented, at the July 29, 2014 evidentiary hearing, regarding the pain and suffering arising from the Genesis project. She recommended tribal consultation and suggested taking a deeper look at the environmental justice question of the burdens placed on the tribal people.

**Phillip Smith** from CRIT commented, at the July 29, 2014 evidentiary hearing, that he participated in the ISEGS hearings, but noted there were no consultations during the ISEGS application. He stated that projects diminish the biological resources and recommended leaving the land alone. He mentioned that there are unmarked burial plots in the desert that tribal people do not talk about because they do not want their ancestors disturbed.

**Arlene Kingery**, the Historic Preservation Officer for the Quechan Indian Tribe, commented, at the July 29, 2014 evidentiary hearing, that historically what the government called consultation amounted to coercion. She recommended cooperation.

She mentioned that it is difficult to understand how mitigation costs are calculated. She recommended consultations with the tribes.

**Valerie Welsh-Tahbo** of the Mohave Indian Tribe commented, at the July 29, 2014 evidentiary hearing, that her family are bird singers. She explained that the land is thought of like a loved child or parent, but its value cannot be quantified. They are not asking for money; this is “a real conundrum and a quandary for us.”

These concerns are all addressed above in this decision.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The expansion of the PAA to include all visible areas within approximately 15 miles of the project area boundary is reasonable and appropriate.
2. There are no new prehistoric archaeological resources in the PSEGS PAA.
3. The PSEGS project is likely to disturb fewer buried cultural resources than the PSPP due to the substantial reduction in grading in the amended project.
4. The town of Desert Center, the Eagle Mountain Railroad, and the Colorado River Aqueduct including the Eagle Mountain Pumping Station, may be eligible for listing on the NRHP/CRHR.
5. The PSEGS and related transmission facilities will not have a significant visual impact on the town of Desert Center.
6. The potential visual impact of PSEGS on the Colorado River Aqueduct and the Eagle Mountain Pumping Station will be less than significant.
7. The potential visual impact of PSEGS on the Eagle Mountain Railroad will be less than significant.
8. The Palen Dunes/Palen Lake TCP is eligible under Criteria 1 and 4 for listing on the CRHR.
9. The Ford Dry Lake TCP is eligible under Criteria 1 and 4 for listing on the CRHR.
10. The Chuckwalla Spring TCP is eligible under Criteria 1, 3, and 4 for listing on the CRHR.
11. The Corn Spring TCP is eligible under Criteria 1, 3, and 4 for listing on the CRHR.
12. The North Chuckwalla Prehistoric Quarry District TCP is eligible under Criteria 1 and 4 for listing on the CRHR.
13. The Long Tank TCP is eligible under Criteria 1 and 4 for listing on the CRHR.

14. The Alligator Rock TCP is eligible under Criteria 1 and 4 for listing on the CRHR.
15. The Dragon Wash TCP is eligible under Criteria 1, 3, and 4 for listing on the CRHR.
16. The San Pascual Well TCP is eligible under Criteria 1 and 4 for listing on the CRHR.
17. All 11 ethnographic resources (TCPs) evaluated in the record are subject to direct visual impacts from the construction, operation, and decommissioning of the PSEGS.
18. The record offers no reason to reevaluate the historical significance of the DTCCL, so the Energy Commission's CRHR eligibility determination for the resource in the PSPP decision stands.
19. The PSEGS will contribute to a cumulative impact to numerous other resources in the vicinity that will be subject to direct impacts as future projects are approved, including, but not limited to, Desert Center Airfield, Camp Desert Center, Observers Camp, 36 Evacuation Hospital, and Ordnance Depot.
20. The Chuckwalla Valley portion of the PRGTL TCP may be eligible under Criteria 1, 3, and 4 for listing on the CRHR.
21. The presence of the PSEGS facility's two heliostat fields, and particularly the two approximately 750-foot-tall solar power towers would introduce stark visual intrusions on the Chuckwalla Valley portion of the PRGTL that would profoundly and irreparably degrade the ability of the landscape to convey its historical significance under CRHR Criterion 1.
22. The construction and operation of the PSEGS project's infrastructure would result in a significant impact on the Chuckwalla Valley portion of the PRGTL.
23. The significant effect of the PSEGS project on the Chuckwalla Valley portion of the PRGTL is not mitigable if the project is constructed as designed in its current location.
24. Compensatory mitigation through revisions to Condition of Certification **CUL-1** would serve to ameliorate the loss of the Chuckwalla Valley portion of the PRGTL's ability to convey its associative values, but would not reduce the PSEGS project's effects to a less-than-significant level.
25. The construction of the PSEGS project will cause a substantial adverse change in the significance of the Chuckwalla Valley portion of the DTCCL.
26. The PSEGS's visual impacts to the PRGTL and DTCCL will be cumulatively considerable and largely unmitigable.

27. The town of Desert Center, the Eagle Mountain Railroad, and the Colorado River Aqueduct including the Eagle Mountain Pumping Station would not be impacted in a significant and adverse manner by the cumulative industrial development in the I-10 corridor and the Chuckwalla Valley.
28. **CUL-1** and **CUL-2** reduce the project's direct and cumulative impacts to the greatest extent possible, but those impacts would not be reduced to a less-than-significant level.
29. **CUL-3** through **CUL-10** remain adequate to mitigate potential inadvertent direct physical impacts that could result from the construction of the amended project.
30. **CUL-11** through **CUL-15** still reduce direct physical impacts to historical resources on the facility site to a less-than-significant level.
31. The PSEGS project's direct and cumulative impacts to cultural resources are borne disproportionately by Native Americans.

## **CONCLUSIONS OF LAW**

1. With implementation of the mitigation measures described in the evidentiary record and incorporated into the conditions, the PSEGS will conform to all applicable LORS related to cultural resources as identified above and in the pertinent portion of Appendix A of this decision.
2. With implementation of the mitigation measures described in the evidentiary record and incorporated into the conditions of certification below, as well as those in other portions of this decision, the PSEGS project will not result in significant direct, indirect, or cumulative impacts to cultural resources except for a significant direct visual impact to all 11 ethnographic resources (TCPs) evaluated in the record, including the Chuckwalla Valley portion of the PRGTL, and the PSEGS impacts to the Chuckwalla Valley portion of the PRGTL and DTCCCL would be cumulatively considerable. The project's significant direct and cumulative visual impacts to cultural resources are largely unmitigable.
3. The PSEGS project would have a beneficial effect on buried cultural resources because it is likely to disturb fewer buried cultural resources than the PSPP due to the substantial reduction in grading in the amended project.
4. There has been a substantial change in circumstances since the original approval because at the time of the original licensing, the project was wholly-owned by Solar. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

### **CUL-1 TREATMENT OF THE CHUCKWALLA VALLEY PORTION OF THE PACIFIC TO RIO GRANDE TRAILS LANDSCAPE (PRGTL)**

The project owner shall contribute a total of \$3,000,000 to the Energy Commission's PRGTL account. The PRGTL account shall be used by the CPM to fund initiatives, the purposes of which are to directly, albeit partially, mitigate impacts to the cultural and spiritual interests of Native American communities who ascribe heritage values to Chuckwalla Valley and, more specifically, to the broader PRGTL. Such initiatives shall be selected by the 15 Native American Tribes listed below and may include the establishment of conservation easements or provide cultural resources education grants. Specific expenses shall be approved by the CPM.

In addition, the project owner shall contribute \$35/acre of disturbance (in accordance with the Revised Phasing Plan, Exhibit 1167) to the PNTCL account. The Energy Commission will create the PRGTL account to finance the completion of programs set out in this condition, the collective purposes of which are to mitigate, in part, for the amended project's direct visual effects and cumulative physical and visual effects on the Chuckwalla Valley portion of the PRGTL, and to integrate tribal participation in such programs. The CPM, in consultation with the US Bureau of Land Management (to avoid duplication of effort), will administer the disbursement of these funds after consultation with the listed Native American Tribes and will provide regulatory oversight of the implementation of the multiple programs.

#### **CPM CONSULTATIONS WITH TRIBES**

The 15 Native American communities who ascribe heritage values to Chuckwalla Valley are:

Agua Caliente Band of Cahuilla Indians

Augustine Band of Cahuilla Indians

Cabazon Band of Mission Indians

Cahuilla Band of Mission Indians

Chemehuevi Indian Tribe

Cocopah Indian Tribe

Colorado River Indian Tribes

Fort Mojave Indian Tribes  
Fort Yuma Quechan Tribe  
Morongo Band of Mission Indians  
Ramona Band of Mission Indians  
San Manuel Band of Mission Indians  
Soboba Band of Luiseno Indians  
Torres-Martinez Desert Cahuilla Indians  
Twenty-nine Palms Band of Mission Indians

The CPM shall initiate and engage in consultations with the listed tribes. The purpose of the consultations is to ascertain the priority of mitigation projects that each tribe recommends for implementation to reduce the significant visual effects of the PSEGS project on cultural resources.

After the CPM has consulted with all the listed tribes, the CPM will convene a meeting (or meetings) between the project owner, Staff and all the tribes to summarize the recommendations the CPM receives through the consultations with the tribes. The purpose of the meeting(s) will be to discuss the recommendations and identify those recommendations that have broad base support among the tribes. The CPM may engage in further consultations with the tribes to help inform the Decision. The CPM shall circulate a draft proposal to all of the listed tribes prior to implementing the proposed mitigation. The CPM shall submit a report to the tribes after finalizing the mitigation funded by the PRGTL account.

#### Public Outreach

The project owner shall fund the production and distribution of copyright-free videographic and photographic images of the PSEGS site, including long-range, mid-range, close-range, and aerial views of the site depicting its relationship to the Chuckwalla Valley. This funding is separate from the Energy Commission's PRGTL account. The project owner will establish a website where the general public can obtain free copies of the images and is responsible for curation of the images.

#### Treatment for Cumulative Effects

The project owner shall contribute to a special fund to be comprised of multiple owners of cumulative project contributors set up by the Energy

Commission to help finance the completion of the documentation program for the Chuckwalla Valley portion of the PRGTL.

The amount of the contribution shall be \$35 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20 percent of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the installments to be commensurate with the actual acreage enclosed or disturbed at the time of payment.

If a project is not certified, or if a project owner does not build the project, or if for some other reason deemed acceptable by the CPM a project owner does not participate in the funding of the PRGTL documentation program, the other project owner(s) may consult with the CPM to adjust the scale of the PRGTL documentation program research activities to match available funding. A project owner that funds the PRGTL documentation program and then withdraws would be able to reclaim their monetary contribution to be refunded on a prorated basis.

**VERIFICATION:**

1. The project owner shall transfer \$3,000,000 to the Energy Commission's PRGTL account no later than 180 days after the initiation of ground disturbance anywhere on the project site.
2. No later than 10 days after receiving notice of the successful transfer of funds to the Energy Commission's PRGTL account, the project owner shall submit a copy of the notice to the Energy Commission's CPM.
3. The project owner shall transfer installments of the \$35/acre fee to the Energy Commission's previously established PTNCL account in increments as approved by the CPM. The first installment shall be paid no later than 180 days after the initiation of ground disturbance anywhere on the project site. At the conclusion of construction, the project owner shall present an accounting of the amount of acres disturbed and the project-specific PTNCL fee shall be adjusted (through an additional payment by the project owner or a refund to the project owner from the Energy Commission) to reflect the total acres disturbed multiplied by \$35 per acre.
4. No later than 10 days after receiving notice of the successful transfer of funds to the Energy Commission's PTNCL account, the project owner shall submit a copy of the notice to the Energy Commission's CPM.

## Public Outreach

1. Prior to ground disturbance, the project owner shall bear the complete cost of all expenses associated with the pre-production, production, post-production, and distribution of the subject video or photographic images. The project owner shall also bear all travel and per diem expenses for the photographer/videographer, as such costs are made part of the project owner's ultimate contract with that party. The project owner and the photographer/videographer must expressly waive and renounce any right, title, and interest in the copyrights of the subject videographic and photographic images.

### **CUL-2 TREATMENT OF DESERT TRAINING CENTER CALIFORNIA-ARIZONA MANEUVER AREA CULTURAL LANDSCAPE (DTCCCL)**

The project owner shall contribute to a special fund set up by the Energy Commission and/or BLM to finance the completion of the documentation for the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCCL).

The amount of the contribution shall be \$25 per acre that the project encloses or otherwise disturbs. Any additional contingency contribution is not to exceed an amount totaling 20 percent of the original contribution. The contribution to the special fund may be made in installments at the approval of the CPM, with the first installment to constitute one-third of the total original contribution amount.

If a project is not certified or if a project owner does not build the project, or if for some other reason deemed acceptable by the CPM a project owner does not participate in funding the DTCCCL documentation program, the other project owner(s) may consult with the CPM to adjust the scale of the DTCCCL documentation program research activities to match available funding. A project owner that funds the DTCCCL documentation program then withdraws will be able to reclaim their monetary contribution to be refunded on a prorated basis.

**VERIFICATION:** No later than 10 days after receiving notice of the successful transfer of funds for any installment to the Energy Commission's special DTCCCL fund, the project owner shall submit a copy of the notice to the Energy Commission's Compliance Project Manager (CPM).

### CUL-3

### CULTURAL RESOURCES PERSONNEL

Prior to the start of ground disturbance (includes “preconstruction site mobilization,” “construction-related ground disturbance,” and “construction-related grading, boring, and trenching,” as defined in the general conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS) and one or more alternate CRSs, if alternates are needed. The CRS shall manage all monitoring, mitigation, curation, and reporting activities in accordance with the conditions.

The CRS shall have a primarily administrative and coordination role for the PSEGS. The CRS may obtain the services of Cultural Resources Monitors (CRMs), if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS implements the **CULTURAL RESOURCES** conditions providing for data recovery from known historical resources and ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to Compliance Project Manager (CPM) approval of the CRS and alternates, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for reasons including, but not limited to, noncompliance on this or other Energy Commission projects.

#### **Cultural Resources Specialist**

The resumés for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of the Interior’s Professional Qualifications Standards as published in Code of Federal Regulations, title 36, part 61. In addition, the CRS shall have the following qualifications:

1. A background in anthropology and prehistoric archaeology;
2. At least 10 years of archaeological resource mitigation and field experience with at least three of those years in California; and
3. At least three years of experience in a decision-making capacity on cultural resources projects with at least one of those years in California, and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

### **Required Cultural Resources Technical Specialists**

The project owner shall ensure that the CRS obtains the services of a qualified prehistoric archaeologist to conduct the research specified in Conditions of Certification **CUL- 11** and **CUL-12**. The Project Prehistoric Archaeologist's (PPA) training and background must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for prehistoric archaeology, as published in Code of Federal Regulations, title 36, part 61, and the resume of the PPA must demonstrate familiarity with similar artifacts and environmental modifications (deliberate and incidental) to those associated with the prehistoric and protohistoric use of the Chuckwalla Valley. The PPA must meet OSHA standards as a "Competent Person" in trench safety.

The project owner shall ensure that the CRS obtains the services of a qualified historical archaeologist to conduct the research specified in Conditions of Certification **CUL-13** and **CUL-14**. The Project Historical Archaeologist's (PHA) training and background must meet the U.S. Secretary of the Interior's Professional Qualifications Standards for historical archaeology, as published Code of Federal Regulations, in title 36, part 61.

The resumes of the CRS, alternate CRS, the PPA, and the PHA shall include the names and telephone numbers of contacts familiar with the work of these persons on projects referenced in the resumes and demonstrate to the satisfaction of the CPM that these persons have the appropriate training and experience to undertake the required research. The project owner may name and hire the CRS, alternate CRS, the PPA, and the PHA prior to certification.

### **Field Crew Members and Cultural Resources Monitors (CRMs)**

CRMs and field crew members shall have the following qualifications:

1. A B.S. or B.A. degree in anthropology, archaeology, historical archaeology, or a related field, and one year experience monitoring in California; or
2. An A.S. or A.A. degree in anthropology, archaeology, historical archaeology, or a related field, and four years experience monitoring in California; or

3. Enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology, or a related field, and two years of monitoring experience in California.

**VERIFICATION:**

1. Preferably at least 120 days, but in any event no less than 75 days, prior to the start of ground disturbance, the project owner shall submit the resumes for the CRS, the alternate CRS(s) if desired, the PPA, and the PHA to the CPM for review and approval.
2. At least 65 days prior to the start of data recovery on known archaeological sites, the project owner shall confirm in writing to the CPM that the approved CRS, the PPA, and the PHA will be available for on-site work and are prepared to implement the **CULTURAL RESOURCES** conditions **CUL-11** through **CUL-15**.
3. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If no alternate CRS is available to assume the duties of the CRS, a monitor may serve in place of a CRS so that ground disturbance may continue up to a maximum of three days without a CRS. If cultural resources are discovered, ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.
4. At least 20 days prior to data recovery on known archaeological sites, the CRS shall provide a letter naming anticipated field crew members for the project and attesting that the identified field crew members meet the minimum qualifications for cultural resources data recovery required by this condition.
5. At least 20 days prior to ground disturbance, the CRS shall provide a letter naming anticipated CRMs for the project and attesting that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this condition.
6. At least five days prior to additional CRMs beginning on-site duties during the project, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

#### **CUL-4 PROJECT DOCUMENTATION FOR CULTURAL RESOURCES PERSONNEL**

Prior to the start of ground disturbance, the project owner shall provide the CRS, the PPA, and the PHA with copies of the AFC, data responses, confidential cultural resources documents, the FSA, and the Commission Decision for the project. The project owner shall also provide the CRS, the PPA, the PHA, and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and maps at an appropriate scale (e.g., 1:2400 or 1" = 200') for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be provided to the CRS, the PPA, the PHA, and CPM prior to the start of each phase. Written notice identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week including the identification of area(s) where ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

#### **VERIFICATION:**

1. Preferably at least 115 days, but in any event no less than 60 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resources documents, the FSA and the Commission Decision for the project to the CRS, if needed, and to the PPA and the PHA. The project owner shall also provide the subject maps and drawings to the CRS, PPA, PHA, and CPM. Staff, in consultation with the CRS, PPA, and PHA, will review and approve maps and drawings suitable for cultural resources monitoring and data recovery activities.

2. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS, PPA, PHA, and CPM.
3. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS, PPA, PHA, and CPM.
4. Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.
5. Within five days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

**CUL-5 CULTURAL RESOURCES MONITORING AND MITIGATION PLAN (CRMMP)**

Prior to the start of ground disturbance, the project owner shall submit to the CPM for review and approval the CRMMP, as prepared by or under the direction of the CRS, with the contributions of the PPA and the PHA. The CPM shall facilitate review and comment by affected Indian tribes prior to approval. The authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall specify the impact mitigation protocols for all known cultural resources, i.e., archaeological, ethnographic, and historic resources, and identify general and specific measures to minimize potential impacts to all other cultural resources, including those discovered during construction. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, the PPA, and the PHA, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM. Prior to certification, the project owner may have the CRS, alternate CRS, the PPA, and the PHA complete and submit to CEC for review the CRMMP, except for the portions to be contributed by the PTNCL and the DTCCCL programs.

The CRMMP shall include, but not be limited to, the elements and measures listed below.

1. The following statement shall be included in the Introduction: "Any discussion, summary, or paraphrasing of the conditions in this

Cultural Resources Monitoring and Mitigation Plan is intended as general guidance and as an aid to the user in understanding the conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP.” The cultural resources conditions from the Commission Decision are contained in **Appendix A**;

2. The duties of the CRS shall be fully discussed, including coordination of the duties with respect to the completion of the Prehistoric Trails Network Cultural Landscape (PTNCL) documentation program and the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCL) documentation program, and oversight/ management duties with respect to site evaluation, data collection, monitoring, and reporting at both known prehistoric and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction;
3. A general research design shall be developed that:
  - a. Charts a timeline of all research activities, including those coordinated under the PTNCL and DTCCL documentation program;
  - b. Recapitulates the existing paleoenvironmental, prehistoric, ethnohistoric, ethnographic, and historic contexts developed in the PTNCL and DTCCL historic context and adds to these the additional context of the non-military, historic-period occupation and use of the Chuckwalla Valley to create a comprehensive historic context for the PSEGS vicinity;
  - c. Poses archaeological research questions and testable hypotheses specifically applicable to the archaeological resource types known for the Chuckwalla Valley based on the research questions developed under the PTNCL and DTCCL research and on the archaeological and historical literature pertinent to the Chuckwalla Valley; and
  - d. Clearly articulates why it is in the public interest to address the research questions that it poses.

4. Protocols reflecting the guidance provided in Conditions of Certification **CUL-10** through **CUL-15** shall be specified for the treatment of known and newly discovered prehistoric and historic-period archaeological resource types;
5. Artifact collection, retention/disposal, in-situ or on-site reburial (to the extent authorized by BLM), and curation policies shall be discussed as related to the research questions formulated in the research design. These policies shall apply to cultural resources materials and documentation resulting from evaluation and data recovery at known prehistoric-period, ethnographic, and historic-period archaeological sites and any CRHR-eligible (as determined by the CPM) prehistoric and historic-period archaeological sites discovered during construction. A prescriptive treatment plan may be included in the CRMMP for limited data types;
6. The implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post ground–disturbance analysis phases of the project shall be specified;
7. Person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team shall be identified;
8. The manner in which Native American observers or monitors will be included, in addition to their roles in the activities required under Condition of Certification **CUL-1**, the procedures to be used to select them, and their roles and responsibilities shall be described;
9. *Notification of Native American Tribes after a Discovery.* The CRMMP shall identify which Native American Tribes will be notified of events triggering notification requirements and will include manner, type, and timing of the notification;
10. The CRMMP will also describe the steps and timing for addressing an unanticipated discovery;
11. All impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during ground disturbance, construction, and/or operation shall be described. Any areas where these measures are to be implemented shall be identified. The description shall address how these measures would be implemented prior to the start of ground disturbance and how long they would be needed to protect the resources from project-related impacts;

12. The commitment to record on Department of Parks and Recreation (DPR) 523 Series forms to map and to photograph all encountered cultural resources over 50 years of age shall be stated. In addition, the commitment to curate all archaeological materials retained as a result of the archaeological investigations (survey, testing, and data recovery) in accordance with the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections into a retrievable storage collection in a public repository or museum shall be stated;
13. The commitment of the project owner to pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project shall be stated. The project owner shall identify a curation facility that could accept cultural resources materials resulting from PSEGS cultural resources investigations;
14. The CRS shall attest to having access to equipment and supplies necessary for site mapping, photography, and recovery of all cultural resources materials (that cannot be treated prescriptively) from known CRHR-eligible archaeological sites and from CRHR-eligible sites that are encountered during ground disturbance; and
15. The contents, format, and review and approval process of the final Cultural Resources Report shall be described.

**VERIFICATION:**

1. Preferably, at least 90 days, but in any event no less than 45 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval. The CPM shall facilitate review and comment of the CRMMP with affected Native American tribes.
2. At least 20 days prior to the start of ground disturbance, in a letter to the CPM the project owner shall agree to pay curation fees for any materials generated or collected as a result of the archaeological investigations (survey, testing, and data recovery).
3. At least 30 days prior to the start of ground disturbance, the project owner shall provide to the CPM a copy of a letter from a curation facility that meets the standards stated in the California State Historical Resources Commission's Guidelines for the Curation of Archaeological Collections, stating the facility's willingness and ability to receive the materials generated by PSEGS cultural resources activities and requiring curation. Any agreements concerning curation will be retained and available for audit for the life of the project.

## **CUL-6 CULTURAL RESOURCES REPORT (CRR)**

The project owner shall submit the final CRR to the CPM for review and approval and to the BLM Palm Springs archaeologist for review and comment. The final CRR shall be written by or under the direction of the CRS. The final CRR shall report on all field activities including dates, times and locations, results, samplings, and analyses. All survey reports, revised and final Department of Parks and Recreation (DPR) 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the final CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM and to the BLM Palm Springs archaeologist for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

### **VERIFICATION:**

1. Within 30 days after requesting a suspension of construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.
2. Within 180 days after completion of ground disturbance (including landscaping), the project owner shall submit the final CRR to the CPM for review and approval and to the BLM Palm Springs archaeologist for review and comment. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.
3. Within 10 days after the CPM and the BLM Palm Springs archaeologist approve the CRR, the project owner shall provide documentation to the CPM confirming that copies of the final CRR have been provided to the SHPO, the CHRIS, the curating institution (if archaeological materials were collected), and to the tribal chairpersons of any Native American tribes requesting copies of project-related reports.

**CUL-7****WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)**

Prior to and for the duration of ground disturbance, the project owner shall provide WEAP training to all new workers within their first week of employment at the project site, along the linear facilities routes, and at laydown areas, roads, and other ancillary areas. The training shall be prepared by the CRS, may be conducted by any member of the archaeological team, and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance such as landscaping resumes.

The training shall include:

A discussion of applicable laws and penalties under the law;

2. Samples or visuals of artifacts that might be found in the project vicinity;
3. A discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;
4. A discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits;
5. Instruction that the CRS, alternate CRS, and CRMs have the authority to halt ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts as determined by the CRS;
6. Instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;
7. An informational brochure that identifies reporting procedures in the event of a discovery;
8. An acknowledgement form signed by each worker indicating that they have received the training;
9. A sticker that shall be placed on hard hats indicating that environmental training has been completed; and

10. No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

**VERIFICATION:**

1. At least 30 days prior to the start of ground disturbance, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.
2. At least 15 days prior to the start of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP trained worker to sign.
3. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

**CUL-8 CONSTRUCTION MONITORING PROGRAM**

Prior to the start of construction-related ground disturbance such as grading, boring, and trenching (as defined in the general conditions for this project), surface grading or subsurface soil work during pre-construction activities, site mobilization or mowing activities, heavy equipment use in loose or sandy soils at the project site, access roads, and linear facilities including environmental exclusion fencing along roadways, the project owner shall notify the CPM and all interested Native Americans of the date on which ground disturbance will ensue.

The project owner shall ensure that the CRS, alternate CRS, or CRMs monitor, full time, all of the following specified ground disturbance at the project site: 1) surface grading or subsurface soil work during pre-construction activities and site mobilization; 2) mowing activities and heavy equipment use in undisturbed loose or sandy soils defined as Zone 2 or Zone 3 of the sand transport corridor; 3) excavation and grading of the power block and common facilities areas; 4) excavation of trenches; and 5) grading of the access, perimeter, and spoke roads along the linear facilities routes and at laydown areas, roads, and other ancillary areas, to ensure there are no impacts to undiscovered cultural resources and to ensure that known cultural resources are not affected in an unanticipated manner.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the ground-disturbing activities specified in the previous paragraph, for as long as the activities are ongoing.

Where excavation equipment is actively removing dirt and hauling the excavated material farther than 50 feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than 50 feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

In the event that the CRS believes that the required number of monitors is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the number of monitors shall be provided to the CPM for review and approval prior to any change in the number of monitors.

The project owner shall obtain the services of one or more Native American Monitors (NAM) to monitor construction-related ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the NAHC. Preference in selecting a NAM shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified NAM are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow construction-related ground disturbance to proceed without a NAM.

The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered. On forms provided by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the conditions and/or applicable LORS. The daily monitoring logs shall, at a minimum, include the following:

- First and last name of the CRM and any accompanying NAM.
- Time in and out.
- Weather. Specify if weather conditions led to work stoppages.

- Work location (project component). Provide specifics—.e.g., transmission ROW, solar unit A, power block.
- Proximity to site location. Specify if work conducted within 1000 feet of a known cultural resource.
- Work type (machine).
- Work crew (company, operator, and foreman).
- Depth of excavation.
- Description of work.
- Stratigraphy.
- Artifacts, listed with the following identifying features:
  - Field artifact number: When recording artifacts in the daily monitoring logs, the CRS shall institute a field numbering system to reduce the likelihood of repeat artifact numbers. A typical numbering system could include a project abbreviation, monitor's initials, and a set of numbers given to that monitor, e.g., HECA-MB-123.
  - Description.
  - Measurements.
  - UTM.
- Whether artifacts are likely to be isolates or components of larger resources.
- Assessment of significance of any finds.
- Actions taken.
- Plan for the next work day.
- A cover sheet shall be submitted with each day's monitoring logs, and shall at a minimum include the following:
  - Count and list of first and last names of all CRMs and of all NAMs for that day.
  - General description (in paragraph form) of that day's overall monitoring efforts, including monitor names and locations.
  - Any reasons for halting work that day.

- Count and list of all artifacts found that day: include artifact #, location (i.e., grading in Unit X), measurements, UTM's, and very brief description (i.e., historic can, granitic biface, quartzite flake).
- Whether any artifacts were found out of context (i.e., in fill, caisson drilling, flood debris, spoils pile).
- Copies of the daily monitoring logs and cover sheets shall be provided by email from the CRS to the CPM as follows:
- Each day's monitoring logs and cover sheet shall be merged into one PDF document.
- The PDF title and headings, and emails shall clearly indicate the date of the applicable monitoring logs.
- PDFs for any revised or resubmitted versions shall use the word "revised" in the title.
- Daily and/or weekly maps shall be submitted along with the monitoring logs as follows:
  - The CRS shall provide daily and/or weekly maps of artifacts at the request of the CPM. A map shall also be provided if artifact locations show complexity, high density, or other unique considerations.
  - Maps shall include labeled artifacts, project boundaries, previously recorded sites and isolates, aerial imagery background, and appropriate scales.
  - From the daily monitoring logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.
  - The Cultural Resources section of the MCR shall be prepared in coordination with the CRS and shall include a monthly summary report of cultural resources-related monitoring. The summary shall:
    - List the number of CRMs and NAMs on a daily basis, as well as provide monthly monitoring day totals.

- Give an overview of cultural resource monitoring work for that month and discuss any issues that arose.
  - Describe fulfillment of requirements of each cultural mitigation measure.
  - Summarize the confidential appendix to the MCR without disclosing any specific confidential details.
  - Include the artifact concordance table (as discussed under the next bullet point) but with removal of UTM.
- Each MCR, prepared under supervision of the CRS, shall be accompanied by a confidential appendix that contains completed DPR 523A forms for all artifacts recorded or collected in that month. For any artifact without a corresponding DPR form, the CRS shall specify why the DPR form is not applicable or pending (i.e. as part of a larger site update).
- A concordance table that matches field artifact numbers with the artifact numbers used in the DPR forms shall be included. The sortable table shall contain each artifact's date of collection and UTM numbers, and note if an artifact has been deaccessioned or otherwise does not have a corresponding DPR form. Any post-field log recordation changes to artifact numbers shall also be noted.
- DPR forms shall be submitted as one combined PDF.
  - The PDF shall organize DPR forms by site and/or artifact number.
  - The PDF shall include an index and bookmarks.
- If artifacts from a given site location (in close proximity of each other or an existing site) are collected month after month, and if agreed upon with the CPM, a final updated DPR for the site may be submitted at the completion of monitoring. The monthly concordance table shall note that the DPR form for the included artifacts is pending.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

In the event that the CRS believes that the current level of monitoring is not appropriate in certain locations, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resources monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these conditions.

Upon becoming aware of any incidents of non-compliance with the conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the conditions.

When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

**VERIFICATION:**

1. At least 30 days prior to the start of ground disturbance, the CPM will notify all Native Americans with whom Energy Commission staff communicated during the project review of the date on which the project's ground disturbance will begin.
2. At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log and information to be included in the cover sheet for the daily monitoring logs.
3. While monitoring is on-going, the project owner shall submit each day's monitoring logs and cover sheet merged into one PDF document by email within 24 hours.
4. The CRS and/or project owner shall notify the CPM of any incidents of non-compliance with the conditions and/or applicable LORS by telephone or email within 24 hours

5. The CRS shall provide daily maps of artifacts along with the daily monitoring logs if more than 10 artifacts are found per day, or as requested by the CPM.
6. The CRS shall provide weekly maps of artifacts if there are more than 50 artifacts found per week, or as requested by the CPM. The map shall be submitted within 2 business days after the end of each week.
7. Within 15 days of receiving from a local Native American group a request that a NAM be employed, the project owner shall submit a copy of the request and a copy of a response letter to the group notifying them that a NAM has been employed and identifying the NAM.
8. Monthly, while monitoring is on-going, the project owner shall submit MCRs and accompanying monthly summary reports. The project owner shall attach any new DPR 523A forms, under confidential cover, completed for finds treated prescriptively as specified in the CRMMP.
9. Final updated DPRs with sites (where artifacts are collected month after month) can be submitted at the completion of monitoring as agreed upon with the CPM.
10. At least 48 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM for review and approval a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level and concurrently notify affiliated Native American tribal entities.
11. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM for review and approval a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.
12. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

**CUL-9      AUTHORITY TO HALT CONSTRUCTION; TREATMENT OF DISCOVERIES**

The project owner shall grant authority to halt ground disturbance to the CRS, alternate CRS, PPA, PHA, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event that a cultural resource over 50 years of age is found (or, if younger, determined exceptionally significant by the CPM), or impacts to

such a resource can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting, as provided in other conditions, shall continue during the project's ground-disturbing activities elsewhere. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery and all of the following have occurred:

1. The CRS has notified the project owner and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resource discovery occurs between 8:00 A. M. on Friday and 8:00 A. M. on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e., work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for data recovery from any cultural resource discoveries, whether or not a determination of CRHR eligibility has been made.
2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery within 48 hours of the initial discovery.
3. The CRS has completed field notes, measurements, and photography for a DPR 523 "Primary" form. Unless the find can be treated prescriptively, as specified in the CRMMP, the "Description" entry of the DPR 523 "Primary" form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.
4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS's proposed data recovery plan, if any, including the curation of the artifacts, or other appropriate mitigation, and any necessary data recovery and mitigation have been completed.

**VERIFICATION:**

1. At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, PPA, PHA, and CRMs have the authority to halt ground disturbance in the vicinity of a cultural resource discovery, and that the project owner shall ensure that the

CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resource discovery occurs between 8:00 A. M. on Friday and 8:00 A. M. on Sunday morning.

2. Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.
3. Unless the discovery can be treated prescriptively as specified in the CRMMMP, completed DPR 523 forms for resources newly discovered during ground disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

**CUL-10 CUL-10 FLAG AND AVOID**

If resources within the transmission line corridor can be spanned rather than impacted, or resources within the solar field can be feasibly avoided by adjustment of an individual heliostat, or in the event that new resources are discovered during construction where impacts can be reduced or avoided, the project owner shall:

1. Ensure that a CRS, alternate CRS, PPA, or CRM re-establish the boundary of each site, add a 10 meter wide buffer around the periphery of each site boundary, and flag the resulting space in a conspicuous manner;
2. Ensure that a CRM enforces avoidance of the flagged areas during PSEGS construction; and
3. Ensure, after completion of construction, boundary markings around each site and buffer are removed so as not to attract vandals.

In the event a resource can be avoided, data recovery required by these conditions shall not be performed.

**DATA RECOVERY FOR SIMPLE PREHISTORIC SITES**Sparse Lithic Scatters, Cairns, and Pot Drops

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type “simple prehistoric sites,” consisting of the site SMP-P-MT-001 and SMP-P-2018. This site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include the use of the CARIDAP protocol on sites that qualify, how to proceed if features or other buried deposits are encountered, and the materials analyses and laboratory artifact analyses that will be used.

The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall ensure that the CRS, the PPA and/or archaeological team members implement the plan that (for sites where CARIDAP does not apply) includes, but is not limited to, the following tasks:

1. Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages; site boundaries; location of each individual artifact; and the boundaries around individual artifact concentrations;
2. Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PTNCL geoarchaeologist not be available, to identify the specific landform for each site and its relationship to specific ancient lakeshores of Palen Dry Lake; if a lakeshore is present within 100 meters of the site boundary, include it on the site map;
3. Map and field-record all lithic artifacts (numbers of flakes, the reduction sequence stage each represents, cores, tool blanks, finished tools, hammerstones, and concentrations, and the material types of each) and the other types of prehistoric artifacts present;
4. Map any differential distribution of artifacts and suggest explanations for the distribution;
5. Assess the integrity of the site and provide the evidence substantiating that assessment;

6. Collect for dating and source analyses any obsidian artifacts;
7. Field record the surface location of all other artifacts and collect all ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;
8. Surface scrape to a depth of 5 centimeters a 5-meter-by-5-meter area centered on the artifact concentration, field-record the lithic artifacts as to location, material type, and the reduction sequence stage each represents, record the location of all other artifacts, and retain the obsidian and ceramic artifacts and botanical and faunal remains for laboratory analysis and curation;
9. Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials, placing the unit in the part of the site with the highest artifact density and recording its locations on the site map;
10. Place one 1-meter-by-1-meter excavation unit, as described above, in the center of each concentration if multiple artifact concentrations have been identified;
11. Notify the CPM by telephone or e-mail that subsurface deposits were or were not encountered and make a recommendation on the site's CRHR eligibility;
12. If no subsurface deposits were encountered and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;
13. If subsurface deposits are encountered, test the horizontal limits of the site by excavating additional 1-meter-by-1-meter excavation units in 10-centimeter levels until the unit reaches a depth of 20 centimeters below any anthropogenic materials using a shovel or hand auger or other similar technique, at four spots equally spread around the exterior edge of each site, recording the locations of these units on the site map;
14. Sample the encountered features or deposits using the methods described in the CRMMP, record their locations on the site map, retain samples such as flotation, pollen, and charcoal for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation until data recovery is complete;

15. Present the results of the Condition of Certification **CUL-11** data recovery in a letter report by the PPA or CRS, which shall serve as a preliminary report. Letter reports may address one site or multiple sites depending on the needs of the CRS. The letter report shall be a concise document that provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, a map showing the location of excavation units including topographic contours and the site landforms, and a discussion of the CRHR eligibility of each site and the justification for that determination;
16. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites including new data on seasonal drainages, site boundaries, location of each individual artifact, the boundaries around individual artifact concentrations, the landform, and the eligibility determination;
17. Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and
18. Present the final results of data recovery at these prehistoric sites in the CRR as described in Condition of Certification **CUL-6**.

**VERIFICATION:**

1. At least 45 days prior to ground disturbance within 30 meters of the “prehistoric sites,” the project owner shall notify the CPM that data recovery for small sites has ensued.
2. After the completion of the excavation of the first 1-meter-by-1-meter excavation unit at each of the subject sites, the CRS shall notify the CPM regarding the presence or absence of subsurface deposits and shall make a recommendation on the site’s CRHR eligibility.
3. Within one week of the completion of data recovery at a site, the project owner shall submit a letter report written by the PPA or CRS for review and approval of the CPM. When the CPM approves the letter report, ground disturbance may begin at this site location.

**CUL-12****DATA RECOVERY FOR COMPLEX PREHISTORIC SITES**

The project owner shall ensure the CRMMP includes a data recovery plan for the resource type “complex prehistoric sites,” consisting of SMP-P-2023, MH-001, MH-002, MH-003, MH-006, MH-008, MH-009, MH-010, MH-011, MH-012, MH-013, MH-014, and MH-015. This site list may be revised only with the agreement of the CRS and the CPM. The data recovery plan shall include how to proceed if buried deposits are encountered and shall also include the materials analyses and laboratory artifact analyses that will be used. The plan shall also specify in detail the location recordation equipment and methods used and describe any post-processing of the data. If allowed by the BLM, prior to the start of ground disturbance within 30 meters of the site boundaries of each of these sites, the project owner shall then ensure that the CRS, the PPA, and/or archaeological team members implement the plan that shall include, but not be limited to, the following tasks:

1. Use location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers) to add to the original site maps the following features: seasonal drainages; site boundaries; location of each individual artifact; and the boundaries around individual artifact concentrations;
2. Request the PTNCL PG, or equivalent qualified person approved by the CPM and hired by the project owner should the PG not be available, to identify the specific landform for each site and its relationship to prior playa shorelines of Palen Dry Lake. If an identifiable shoreline is present within 100 meters of the site boundary, include it on the site map;
3. Map any differential distribution of artifacts and suggest an explanation for this distribution;
4. Assess the integrity of the site and state the evidence substantiating that opinion;
5. Collect all artifacts after their locations are marked and submit them for laboratory analysis;
6. Excavate one 1-meter-by-1-meter unit in 10-centimeter levels until three sterile levels are encountered, or until the unit reaches maximum depth of planned impact, placing this unit in the part of the site with the highest artifact density or, if multiple artifact

concentrations were identified, place one 1-meter-by-1-meter excavation unit in the center of each concentration and excavate as just described, and retain any artifacts for laboratory analysis;

7. Determine the vertical and horizontal limits of the each site by placing test units at four locations equally spread around the surface exterior edge and excavating or probing down to the Holocene basement using a shovel, hand auger, or similar technique; continue exploration in all directions until the horizontal limits of the site are reached and retain any artifacts for laboratory analysis;
8. Excavate the surface feature or features using the methods described in the CRMMP, record their locations on the site map, retain samples, such as flotation, pollen, and charcoal, for analysis, and retain all artifacts for professionally appropriate laboratory analyses and curation until data recovery is complete;
9. Notify the CPM by telephone or e-mail that subsurface deposits were or were not encountered and make a recommendation on the site's CRHR eligibility;
10. If no subsurface deposits were encountered and the CPM agrees the site is not eligible for the CRHR, data recovery is complete;
11. If subsurface deposits were found, develop a sampling design for additional data recovery in consultation with the CRS; plans for this contingency shall be described in detail in the CRMMP;
12. Present the results of the Condition of Certification **CUL-12** data recovery in a letter report by the PPA or CRS that shall serve as a preliminary report. Letter reports may address one site, or multiple sites depending on the needs of the CRS. The letter report shall be a concise document that provides description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of excavation units including topographic contours and the site landforms;
13. Update the existing Department of Parks and Recreation (DPR) 523 site form for these sites, including new data on seasonal drainages, site boundaries, location of each individual artifact, the

boundaries around individual artifact concentrations, and the landform;

14. Provide the recovered data to the PTNCL PI-Prehistoric Archaeologist; and
15. Present the final results of data recovery for the complex prehistoric sites in the CRR, as described in Condition of Certification **CUL-6**.

#### **VERIFICATION:**

1. At least 45 days prior to ground disturbance within 30 meters of the “complex Prehistoric sites,” the project owner shall notify the CPM that data recovery for large complex sites has ensued.
2. Within one week of the completion of data recovery at a site, the project owner shall verify this by submitting a letter report written by the PPA or CRS for review and approval of the CPM. When the CPM approves the letter report, ground disturbance may begin at these site locations.

#### **CUL-13 DATA RECOVERY FOR HISTORIC-PERIOD REFUSE SCATTERS**

Prior to the start of ground disturbance, the project owner shall ensure that a recovery plan is included in the CRMMP for upgrading the recordation of historic-period refuse scatter sites located on the proposed plant site. These consist of sites SMP-H-1003, SMP-H- 1004, SMP-H-1006, SMP-H-1008, SMP-H-1009, SMP-H-1010, SMP-H-1011, SMP-H-1012, SMP-H-1013, SMP-H-1020, SMP-H-1021, SMP-H-1022, SMP-H-1023, SMP-H-2002, SMP-H-2003, SMP-H-2004, SMP-H-2006, SMP-H-2007, SMP-H-2008, SMP-H-2010, SMP-H-2011/12, SMP-H-2017, SMP-H-2019, SMP-H-2021; JR-104, JR-105, JR-107, JR-109, JR-110; TC-008, TC-009, TC-020, and TC-032. This site list may be revised only with the agreement of the CRS and the CPM.

The focus of the recordation upgrade is to determine if these sites can be attributed to the DTC/C-AMA use of the region and are therefore contributors to the DTCCL. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but not be limited to, the following tasks:

1. The project owner shall hire a PHA with the qualifications described in Condition of Certification **CUL-3** to supervise the field work;

2. The project owner shall ensure that, prior to beginning the field work, the PHA and crew chief are trained by the DTCCL Historical Archaeologist or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available to identify the specific landform for each site, in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist;
3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late 19th and early to mid 20th Century can, bottle, and ceramic diagnostic traits;
4. The project owner shall ensure that the original site map shall be updated to include, at minimum, landform features such as small drainages, any man-made features, and the limits of any artifact concentrations and features using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers);
5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed documenting the measurements and the types of seams and closures for each bottle and the measurements, seams, closure, and opening method for all cans. Photographs shall be taken of maker's marks on bottles, any text or designs on bottles and cans, and of decorative patterns and maker's marks on ceramics; artifacts shall not be collected;
6. The project owner shall ensure that the details of what is found at each site shall be presented in a letter report from the CRS or PHA, which shall serve as a preliminary report that details what was found at each site, as follows:
  - a. Letter reports may address one site or multiple sites depending on the needs of the CRS;
  - b. The letter report shall be a concise document that provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that

tally, and a map showing the location of collection and/or excavation units including topographic contours and the site landforms; and

- c. The letter report shall make a recommendation on whether each site is a contributor to the DTTCL.
7. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL; and
8. The project owner shall ensure that the PHA analyzes all recovered data and writes or supervises the writing of a comprehensive final report. This report shall be included in the CRR (Condition of Certification **CUL-6**).

#### **VERIFICATION:**

1. At least 45 days prior to ground disturbance within 30 meters of the “Historic Period Refuse Scatters,” the project owner shall notify the CPM that mapping and an upgraded in-field artifact analysis has ensued on the historic-period refuse scatter sites.
2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS, evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that is the subject of the letter report.

#### **CUL-14 DATA RECOVERY FOR HISTORIC-PERIOD SITES WITH FEATURES**

Prior to the start of ground disturbance, the project owner shall ensure that a data recovery plan is included in the CRMMP for evaluation and data recovery from historic-period archaeological sites with features. These sites consist of sites SMP-H-1005, SMP-H-1007, SMP-H-2016, MH-007, and JR-108. This site list may be revised only with the agreement of the CRS and the CPM. The plan shall specify in detail the location recordation equipment and methods to be used and describe any anticipated post-processing of the data. The project owner shall then ensure that the CRS, the PHA, and/or archaeological team members implement the plan, if allowed by the BLM, which shall include, but is not limited to, the following tasks:

1. The project owner shall hire a PHA with the qualifications described in Condition of Certification **CUL-3** to supervise the field work;
2. The project owner shall ensure that, prior to beginning the field work, the PHA and crew chief are trained by the DTCCL Historical Archaeologist, or equivalent qualified person approved by the CPM and hired by the project owner should the DTCCL Historical Archaeologist not be available, in the identification, analysis and interpretation of the artifacts, environmental modifications, and trash disposal patterns associated with the early phases of WWII land-based U.S. army activities, as researched and detailed by the DTCCL PI-Historian and the DTCCL Historical Archaeologist;
3. The project owner shall ensure that, prior to beginning the field work, the field crew members are also trained in the consistent and accurate identification of the full range of late 19<sup>th</sup> and early to mid 20<sup>th</sup> Century can, bottle, and ceramic diagnostic traits;
4. The project owner shall ensure that the original site map shall be updated to include, at minimum, landform features such as small drainages, any man-made features, the limits of any artifact concentrations and features (previously known and newly found in the metal detector survey), using location recordation equipment that has the latest technology with sub-meter accuracy (such as UTM 11 North or California Teale Albers);
5. The project owner shall ensure that a detailed in-field analysis of all artifacts shall be completed if not done previously. Types of seams and closures for each bottle and all cans shall be documented. Photographs shall be taken of any text or designs. Unusual or unidentifiable artifacts may be collected for further analysis, but otherwise artifacts shall not be collected;
6. The project owner shall ensure a systematic metal detector survey be completed at each site and that each "hit" is investigated. All artifacts and features thus found must be mapped, measured, photographed, and fully described in writing;
7. The project owner shall ensure that all features are recorded and that any features having subsurface elements are excavated by a qualified historical archaeologist. All features and contents must be mapped, measured, photographed, and fully described in writing;

8. The project owner shall ensure that the details of what is found at each site be presented in a letter report from the CRS or PHA that shall serve as a preliminary report detailing what was found at each site as follows:
  - a. Letter reports may address one site or multiple sites depending on the needs of the CRS;
  - b. The letter report shall be a concise document that provides a description of the schedule and methods used in the field effort, a preliminary tally of the numbers and types of features and deposits that were found, a discussion of the potential range of error for that tally, and a map showing the location of collection and/or excavation units, including topographic contours and the site landforms; and
  - c. The letter report shall make a recommendation on whether each site is a contributor to the DTCCL.
9. The project owner shall ensure that the data collected from the field work shall be provided to the DTCCL Historical Archaeologist to assist in the determination of which, if any, of the historic-period sites are contributing elements to the DTCCL; and
10. The project owner shall ensure that the PHA analyzes all recovered data and writes or supervises the writing of a comprehensive final report; this report shall be included in the CRR (Condition of Certification **CUL-6**).

**VERIFICATION:**

1. At least 45 days prior to ground disturbance within 30 meters of the “Historic Period Sites with Features,” the project owner shall notify the CPM that mapping and in-field artifact analysis has ensued on historic-period sites with features.
2. Within one week of completing data recovery at a site, the project owner shall submit to the CPM for review and approval a letter report written by the CRS evidencing that the field portion of data recovery at each site has been completed. When the CPM approves the letter report, ground disturbance may begin at the site location(s) that are the subject of the letter report.

**CUL-15 DATA RECOVERY ON HISTORIC-PERIOD ROADS**

The project owner shall ensure that a qualified architectural historian (must meet the U.S. Secretary of the Interior’s Professional Qualifications

Standards for historian, as published in Code of Federal Regulations, title 36, part 61) conducts research and writes a report on the age and use of SMP-H-1032.

The project owner may undertake this task prior to Energy Commission certification of the project.

**VERIFICATION:**

1. At least 15 days prior to ground disturbance, the project owner shall submit to the CPM the historian's report documenting the age and historical use of the road.
2. Within 15 days after the CPM approves the report, the project owner shall forward it to the DTCCL PI-Historian.

**CUL-16 COMPLIANCE WITH BLM PROGRAMMATIC AGREEMENT**

If provisions in the BLM PSEGS Programmatic Agreement and associated implementation and monitoring programs conflict with or duplicate these conditions, the BLM provisions shall take precedence. Provisions in these conditions that are additional to or exceed BLM provisions and represent requirements under the Energy Commission's CEQA responsibilities shall continue to apply to the project's activities, contingent on BLM's approval as authorized by federal law.

**CUL-17 DELETED**

**CUL-18 TREATMENT OF DESERT TORTOISE EXCLUSION FENCE ALONG I-10 RIGHT-OF-WAY PROXIMATE THE PROJECT**

1. To comply with Condition of Certification **BIO-9** (Desert Tortoise Clearance Surveys and Fencing), permanent desert-tortoise-proof fencing shall be installed along the existing I-10 right-of-way fencing. The project owner shall determine the precise location of the alignments for the exclusion fence relative to the extant Caltrans ROW fence and verify whether said alignments are subject to the BLM or Caltrans environmental jurisdiction.
2. The project owner shall design and conduct a class III pedestrian archaeological survey per the Energy Commission's siting regulations. The design of the class III archaeological survey shall be submitted to the CPM for review and approval prior to submittal of a request for encroachment permit to Caltrans and/or fieldwork authorization from BLM for conducting the survey.

3. If the exclusion fence is in Caltrans' jurisdiction, refer to the Caltrans Environmental Handbook, volume 2, and determine which forms and technical reports would typically be requisite for an applicant for a Caltrans ROW encroachment permit. If the exclusion fence or associated staging/ construction area is in BLM's jurisdiction, refer to the BLM Manual (section 8110, Identifying and Evaluating Cultural Resources).
4. The project owner shall prepare a technical report of the above class III pedestrian survey for review and approval by the CPM. The report shall include a catalogue and evaluation of all cultural resources encountered in the survey and the eligibility of the resources for inclusion on the California Historic Resources Inventory. The report shall promulgate any necessary avoidance, minimization and mitigation measures to assure impacts to cultural resources resulting from the construction, installation and maintenance of the exclusion fence are less than significant. Such measures shall be consistent with the criteria and protocol for recordation and the avoidance, minimization and mitigation measures contained in Condition of Certification **CUL-10** (FLAG AND AVOID), Condition of Certification **CUL-11** (DATA RECOVERY FOR SIMPLE PREHISTORIC SITES), Condition of Certification **CUL-12** (DATA RECOVERY FOR COMPLEX PREHISTORIC SITES), and Condition of Certification **CUL-13** (DATA RECOVERY FOR HISTORIC-PERIOD REFUSE SCATTERS). The technical report prepared for the class III survey shall be incorporated into the Cultural Resources Monitoring and Mitigation Plan required in **CUL- 5**, either as an addendum or appendix.

#### **VERIFICATION:**

1. The design for the class III survey shall be submitted to the CPM for review and approval at least 30 days prior to submitting a request for an encroachment permit to Caltrans and/or fieldwork authorization from BLM for conducting the survey.
2. The technical report of the class III survey shall be submitted to the CPM for review and approval at least 30 days prior to submitting a request to Caltrans for an encroachment permit and/or BLM for right-of-way grant prior to construction and installation of the exclusion fence.

3. Monitoring of exclusion fence construction shall be in accordance with Condition of Certification **CUL-8**, and treatment of any unanticipated discoveries of cultural resources during construction shall be in accordance with the provisions of Conditions **CUL-9** through **CUL-13**.

## **D. GEOLOGICAL AND PALEONTOLOGICAL RESOURCES**

### **DESCRIPTION OF MODIFICATIONS**

The modifications proposed in the Palen Solar Electric Generating System (PSEGS) petition (as more fully described in the **PROJECT DESCRIPTION** section of this Decision) include two 250-MW power-generating units, each consisting of a dedicated field of approximately 85,000 heliostats, a 750-foot solar tower and receiver, a power block, a natural-gas-fired auxiliary boiler, a natural-gas-fired night preservation boiler, a diesel-fired emergency fire pump system, a diesel-fired emergency electric generator system, a wet surface air condenser unit, an approximately 15-acre common facilities area (reduced from Palen Solar Power Plant's (PSPP) 50-acre common facilities area) located in the southwestern corner of the site, with an administrative warehouse building and two 2-acre evaporation ponds (reduced from four 2-acre evaporation ponds for the PSPP). Additional equipment includes mirror washing machines, an approximately 203-acre temporary construction lay-down area located in the southwestern portion of the site immediately north of the common facilities area, and a re-routed generation tie-line near the western end of the route and around the newly-constructed Red Bluff Substation. The PSEGS project will eliminate the secondary emergency access road, reduce the project footprint from 4,366 acres to 3,794 acres, and reduce the amount of grading by 4.3 million cubic yards, because the heliostat technology does not require an entirely flat surface. (Ex. 2000, p. 4.9-6.)

The following evidence on geological and paleontological resources was received into evidence on October 28, 2013: Exhibits 1003, 1060, 1077, 2000, 2003, 2008 and 2011. (10/28/13 RT 234:6 – 236:1.)

The PSEGS solar plant would be constructed using the following specifications:

#### **Spread Footings**

For most of the PSEGS project power block and common areas, shallow footings would be on the order of one and a half to four feet thick with an approximate top of footing set approximately two feet below grade requiring between three and a half to six feet of excavation. (Ex. 2000, p. 5.2-5.)

#### **Slabs and Mat Foundations – Buildings and Small Equipment**

Slabs and mat foundations placed near grade elevation can range from six inches to four feet thick and may be placed at grade level. Over-excavation of poor surface soils to two feet of depth that extend up to five feet beyond the slab or mat may be required in accordance with the preliminary geotechnical report. (Ex. 2000, p. 5.2-5.)

## **Large Foundations**

Deeper mat foundations for the solar tower and STG are sized based on the preliminary geotechnical report that was prepared and submitted as part of the PSPP. Foundation design site parameters need to be verified with a specific soils investigation that addresses the power block foundation requirements. Note that an increase in the depth of these foundations requires an increase in the footing width to maintain the same contact pressure. The suggested foundation sizes can also be used as a pile-supported mat should further geotechnical investigation indicate the soil-supported settlements are greater than currently anticipated. (Ex. 2000, p. 5.2-5.)

### **Solar Tower**

At the solar tower, the footing size would be 195 ft. octagonal diameter (across flats) with a depth of 6'0" below finish grade and soil disturbance to 8'6" below grade. (Ex. 2000, p. 5.2-5.)

### **Steam Turbine Generator (STG)**

At the STG foundation, the mat will range from 3'0" thick at the Lube Oil and Excitation Container area to between 6'6" to 8'0" thick under the STG and may extend beyond the edges of the STG unit to pick up the adjacent equipment skids. (Ex. 2000, p. 5.2-6.)

### **Heliostats**

The solar plant will use approximately 85,000 heliostats—elevated mirrors guided by a tracking system mounted on a pylon—to focus the sun's rays on a SRSG atop a tower near the center of the solar field. The support pylons for the heliostats will be installed using vibratory technology to insert the pylons into the ground (pre-augering prior to the installation of the pylon may be required). Depths are not expected to be greater than 12 feet. The heliostat assembly (mirrors, support structure and aiming system) will be mounted on the pylon. The majority of the project site will maintain the original grades and natural drainage features and, therefore, construction will require machines that are maneuverable and can negotiate the terrain. (Ex. 2000, p. 5.2-6.)

### **Onsite Electric Transmission System**

The on-site electric transmission system would consist of underground cables to convey power from the power blocks to the switchyard. The cables would be routed under the paved access roads. The installation of the transmission system would involve trenching to accommodate the underground electric transmission lines. The trench depth is expected to be up to 10 feet. Manholes located at intervals of approximately 1,000 to 2,000 feet may require excavation up to depths of 12 feet. (Ex. 2000, p. 5.2-6.)

## **Generation Tie-Line**

A slight re-routing of the generation tie-line near the western end of the route and around the newly-constructed Red Bluff Substation is proposed. The purpose of this re-routing is to align the PSEGS generation tie-line route immediately adjacent to the NextEra Desert Sunlight generation tie-line to minimize crossings over Interstate 10 (I-10) and to ensure easy entry into the Red Bluff Substation nearest the PSEGS breaker position. (Ex. 2000, p. 5.2-6.)

## **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that with the implementation of the conditions of certification, the PSPP Project would comply with all applicable laws, ordinances, regulations and standards (LORS), and would not result in any unmitigated and significant direct, indirect or cumulative adverse impacts to geological or paleontological resources.

The PSPP Decision found that the site is located in a moderately-active geologic area of the eastern Mojave Desert geomorphic province in eastern Riverside County, California. The main geologic hazards at this site include strong ground shaking, hydro-compaction, dynamic compaction, and corrosive soils. The Decision found that these potential hazards could be effectively mitigated through facility design by incorporating recommendations contained in a design-level geotechnical report as required by the California Building Code and condition of certification **GEO-1**, as well as conditions of certification found in the **FACILITY DESIGN** section of the Decision. The Decision noted that the PSPP project area was currently not used for mineral production, nor was it under claim, lease, or permit for the production of locatable, leasable, or salable minerals. The PSPP Decision recognized that sand and gravel resources were not only present at the site, but were also available throughout the regional area with the result the PSPP project would not have a significant impact on the availability of such resources. There were no other known geological or mineralogical resources at the PSPP site.

The PSPP Decision acknowledged that paleontological resources had been documented in older Quaternary alluvium similar to that located on the project site. The Commission decided that potential impacts to paleontological resources would be mitigated through worker training and monitoring by qualified paleontologists as required by Conditions of Certification **PAL-1** through **PAL-7**.

The Decision found that the potential for intense levels of earthquake-related ground shaking and settlement due to earthquake were geologic hazards that could affect the PSPP. The PSPP evidentiary record contained a geotechnical evaluation and standard engineering design recommendations for mitigation of seismic shaking and site soil conditions applicable to the project site. Potential geologic hazards to the project were

found to be effectively mitigated by standard engineering design measures as specified in Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** of the **FACILITY DESIGN** section of the Decision. The evidence established a low potential for significant adverse impacts to the PSPP project from geologic hazards during its design life. The Decision also found that there was a low potential for significant adverse impacts to geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the PSPP project.

The Decision found that liquefaction, lateral spreading, dynamic compaction, hydrocompaction, subsidence, expansive soils, corrosive soils, landslides, flooding, tsunamis, seiches, and volcanic hazards posed low or negligible risks to the project.

The Decision noted that the PSPP site is located within an established Mineral Resource Zone (MRZ) 4, but no economically-viable mineral deposits are known to be present at the site. There was no evidence of known active faults or potential geological or mineralogical resources at the PSPP site or along the linear alignments.

The Commission found that project construction-related mass grading, deep foundation excavation, and utility trenching that penetrated underlying undisturbed soils held a high potential for exposure of paleontological resources until determined otherwise by the project paleontological resource specialist (PRS). The Decision imposed several mitigation measures to avoid impacts to any paleontological resources discovered that included worker education, preparing a Paleontological Monitoring and Mitigation Plan, and requiring the presence of a PRS onsite. These mitigation measures are found in Conditions of Certification **PAL-1** through **PAL-7** below.

The PSPP Decision concluded that the facility could be designed and constructed to minimize the effect of geologic hazards and impacts to potential paleontological resources at the site during project design life. No geologic hazards that would arise due to cumulative effects during operation of the PSPP facility were identified during this investigation. (PSPP Final Decision, CEC-800-2010-011, **GEOLOGICAL AND PALEONTOLOGICAL RESOURCES**, pp. 8 – 9.)

## **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

The Final Staff Assessment (FSA) of the PSEGS (Exhibit 2000) describes in detail the site's current setting and existing conditions regarding the project's soils, geology, stratigraphy, and groundwater levels. (Ex. 2000, pp. 5.2-6 – 5.2-9.)

The FSA describes Staff's analytical methodology and relevant (LORS). (Ex. 2000, pp. 5.2-2 – 5.2-5.) Since the geology and paleontological resources remain unchanged from the approved PSPP Decision, we incorporate by reference its descriptions of the existing baseline conditions at the PSEGS site. (Ex. 2000, pp. 5.2-6 – 5.2-9.)

## **Direct/Indirect Impacts and Mitigation**

Ground shaking, hydrocompaction, dynamic compaction, expansive soils, and corrosive soils represent the main geologic hazards at the PSEGS site. These potential hazards could be effectively mitigated through facility design by incorporating recommendations contained in the project geotechnical evaluation as required by Condition of Certification **GEO-1**. Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **FACILITY DESIGN** section mitigate these impacts to a less-than-significant level. (Ex. 2000, p. 5.2-9.)

The site is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals. Sand and gravel resources are present at the site; however, such materials are present throughout the regional area such that the PSEGS should not have a significant impact on the availability of such resources. In addition, the potential resource would become available again following facility closure. Only limited exploration for oil and gas resources has been performed in the area, and no active oil or gas operations are located in the immediate vicinity of the project. As a result, the PSEGS would not impact any current or reasonably foreseeable development of geologic or mineral resources. (Ex. 2000, p. 5.2-9.)

Staff argues that there is a high probability that paleontologic resources will be encountered during grading and excavation in the older Quaternary age alluvial and lacustrine sediments. Further, deeper excavations in the younger alluvium that will encounter the underlying older Quaternary age alluvial soils will also have a “high probability” to encounter paleontologic resources. Conditions of Certification **PAL-1** to **PAL-8** are designed to mitigate potential impacts to paleontologic resources to less-than-significant levels in areas where conventional excavation operations occur. These conditions of certification essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional PRS. (Ex. 2000, p. 5.2-10.) Conditions of Certification **PAL-1** to **PAL-8** are not in dispute.

Staff recommended Condition of Certification **PAL-9** to mitigate for potential impacts to paleontological resources by requiring a subsurface paleontological characterization in areas where pylons are to be vibro-inserted. Petitioner and Intervenor Colorado Indian Tribes oppose Condition of Certification **PAL-9** (see discussion below under the heading “Construction Impacts and Mitigation”).

## **Geologic Hazards**

The evidence indicates that the possibility of geologic hazards significantly affecting the operation of the plant site during its practical design life is low. However, geologic hazards must be addressed in a design-level project geotechnical report per CBC (2010) requirements and Condition of Certification **GEO-1**. (Ex. 2000, p. 5.2-11.)

## **Faulting and Seismicity**

The close proximity of the site to the Mojave-Sonoran belt and relatively great distance from more seismically active areas to the west and northwest would suggest a relatively low to moderate probability of intense ground shaking in the project area. However, events such as the Landers earthquake (M7.6), which occurred on June 28, 1992, approximately 78 miles from the site (Blake 2000b), demonstrate that the site could be subject to moderate levels of earthquake-related ground shaking in the future. (Ex. 2000, p. 5.2-13.)

The potential for and mitigation of the effects of strong seismic shaking during an earthquake will be addressed in a project-specific geotechnical report per CBC 2010 requirements, and Condition of Certification **GEO-1** and **FACILITY DESIGN** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**. Compliance with these conditions of certification ensure the project will be built to current seismic standards and potential impacts will be mitigated to insignificant levels in accordance with current standards of engineering practice. (Ex. 2000, p. 5.2-14.)

## **Liquefaction**

Liquefaction is a condition in which a saturated cohesion-less soil may lose shear strength because of sudden increase in pore water pressure caused by an earthquake. However, the potential for liquefaction of strata deeper than approximately 40 feet below surface is considered negligible due to the increased confining pressure and because geologic strata at this depth are generally too compact to liquefy. (Ex. 2000, p. 5.2-14.)

The site is located within an area with a low-to-moderate level of liquefaction. However, the estimated depth to ground water based on measured values in boreholes and wells near the PSEGS site is greater than 60 feet below existing grade. In addition, the typical medium (dense- to very-dense nature of the coarse grain soils encountered in the PSEGS borings) indicates that there is no liquefaction potential at the site. (Ex. 2000, p. 5.2-14.)

## **Lateral Spreading**

Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope; that is, a nearby steep hillside or deeply eroded stream bank. Other factors such as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers

also affect the amount of lateral spreading. Because the site is not subject to catastrophic liquefaction-induced settlement, the potential for lateral spreading during seismic events would be negligible due to the low relief and very shallow slopes at the site surface. (Ex. 2000, pp. 5.2-14 – 5.2-15).

### **Dynamic Compaction**

Dynamic compaction of soils results when relatively-unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. The site is generally underlain by medium-dense to very-dense granular soils. However, loose sand layers are occasionally present at the surface and as buried layers at the site. The potential for and mitigation of the effects of dynamic compaction of site soils during an earthquake should be addressed in a project-specific geotechnical report as required by the CBC (2010) and Condition of Certification **GEO-1**. Common mitigation methods include deep foundations (driven piles/drilled shafts) for severe conditions, geogrid-reinforced fill pads for moderate severity and over-excavation and replacement for areas of minimal hazard. (Ex. 2000, p. 5.2-15.)

### **Hydrocompaction**

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly leaving an unconsolidated, low-density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. The depositional environment of the Chuckwalla Valley suggests that the soils may be subjected to hydrocompaction. The project geotechnical report indicates that there is a low-to-moderate hydrocompaction potential based on the geotechnical data and the observation of soil profile in the test pits. The potential for and mitigation of the effects of hydrocompaction of site soils should be addressed in a project-specific geotechnical report as required by the CBC (2007) and Condition of Certification **GEO-1**. Typical mitigation measures would include over-excavation/replacement, mat foundations or deep foundations depending on severity and foundation loads. (Ex. 2000, p. 5.2-15.)

### **Subsidence**

The Riverside County General Plan indicates the basin fill sediments in Chuckwalla Valley are susceptible to subsidence. Regional ground subsidence is typically caused by petroleum or ground water withdrawal that increases the effective unit weight of the soil profile, which in turn increases the effective stress on the deeper soils. This results in consolidation or settlement of the underlying soils. However, even during the 1980's

and 1990's, when regional groundwater extraction was at its historic maximum of approximately 48,000 acre feet per year (AFY), no localized or regional subsidence was recorded. Current ground water withdrawals are approximately 2,000 AFY and even the proposed project demand of an additional 201 AFY will not approach historic pumping demands. Additional information with respect to historical and anticipated groundwater pumping is contained in the **SOIL AND WATER RESOURCES** section of this Decision. In addition, no petroleum or natural gas withdrawals are taking place in the PSEGS site vicinity. Therefore, the potential for local or regional ground subsidence resulting from petroleum, natural gas, or groundwater extraction is considered to be very low. (Ex. 2000, pp. 5.2-15 – 5.2-16.)

Local subsidence or settlement may also occur when areas containing compressible soils are subjected to foundation or fill loads. The typical medium dense- to very-dense granular site soils are indicative of low-to-negligible local subsidence. Clay layers present at depth are typically deeper than the anticipated zone of influence of shallow foundations and would therefore not be subjected to consolidation settlement from surcharge loading from conventional shallow foundations. (Ex. 2000, p. 5.2-16.)

### **Expansive Soils**

Soil expansion occurs when clay-rich soils with an affinity for water exist in place at a moisture content below their plastic limit. The addition of moisture from irrigation, precipitation, capillary tension, water line breaks, etc., causes the clay soils to absorb water molecules into their structure, which in turn causes an increase in the overall volume of the soils. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements. The preliminary geotechnical report for the project did encounter potentially expansive clay soils at the ground surface in the northeastern portion of the site. However, inter-bedded layers of clay soils are present in the subsurface soil profile in this area. As a result, there is the potential for expansive soils to be present at the locations of proposed structural improvements. The potential for and mitigation of the effects of expansive site soils will be addressed in a project-specific geotechnical report as required by the CBC (2010) and Condition of Certification **GEO-1**. Typical mitigation measures would include over-excavation/replacement or deep foundations depending on severity and foundation loads. (Ex. 2000, p. 5.2-16.)

### **Corrosive Soils**

Fine grain soils with high in-situ moisture contents that contain sulfides can be corrosive to buried metal pipe, which can lead to premature pipe failure and leaking. Such soils are present at this site and the preliminary geotechnical investigation indicates that site soils could be potentially corrosive to metal pipe. The effects of corrosive soils can be effectively mitigated through final design by incorporating the recommendations of the

site-specific project geotechnical report required by the CBC and Condition of Certification **GEO-1**. Mitigation of corrosive soils with respect to metal pipe typically involves cathodic protection or polyethylene encasement of the pipe. (Ex. 2000, p. 5.2-16.)

### **Landslides**

Due to the low site gradient and the absence of topographically high ground in the immediate site vicinity, the potential for landslide impacts to the site is considered to be negligible. (Ex. 2000, p. 5.2-16.)

### **Flooding**

The PSEGS area has not been mapped by the Federal Emergency Management Agency (FEMA) for flood potential. Because the site is topographically higher than Palen Dry Lake to the north, the potential for flooding at the site is limited to infrequent high volume (flash flood) events, which may occur due to heavy rainfall in the Chuckwalla Mountains southwest of the site. Storm waters would be carried across the PSEGS site from roughly southwest to northeast via existing drainages. Site drainage would be modified during project construction and other engineering improvements would also be made to mitigate potential impacts due to catastrophic events. (See additional information in the **SOIL AND WATER RESOURCES** section of this Decision. (Ex. 2000, p. 5.2-17.)

### **Tsunamis and Seiches**

The PSEGS site is not located near any significant surface water bodies and therefore the potential for impacts due to tsunamis and seiches is considered to be negligible. (Ex. 2000, p. 5.2-17.)

### **Volcanic Hazards**

The site is located approximately 40 miles west of the Lavic Lake Volcanic Hazard Area (VHA), an approximately 14-square-mile area within the Mojave Desert comprised of Miocene to Holocene age dacitic to basaltic flows, pyroclastic rocks, and volcaniclastic sediments. The Lavic Lake VHA has been designated by the USGS as an area subject to lava flows and tephra deposits associated with basalt or basaltic andesite vents. The Amboy Crater – Lavic Lake VHS is also considered to be subject to future formation of cinder cones, volcanic ash falls, and phreatic explosions. The recurrence interval for eruptions has not been determined, but is likely to be in the range of one thousand years or more. Because the site is not located within a designated VHA, staff considers the likelihood of significant impacts to the project resulting from volcanic activity would be low. (Ex. 2000, p. 5.2-17.)

## **GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES**

### **Geologic and Mineralogical Resources**

The site is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals. Sand and gravel resources are present at the site and could potentially be a source of salable resources; however, such materials are present throughout the regional area such that the PSEGS should not have a significant impact on the availability of such resources. (Ex. 2000, p. 5.2-17.)

The PSEGS site is mapped as Mineral Resource Zone (MRZ)-4. Mineral Resource Zone-4 refers to “areas of no known mineral occurrences where geologic information does not rule out either the presence or absence of industrial mineral resources.” (Ex. 2000, p. 5.2-17.)

No economically viable mineral deposits are known to be present at the site and no mines are known to have existed within the PSEGS project boundaries. Many inactive mines and mineral prospects are hosted by metamorphic and intrusive basement rocks within 10 miles of the project boundary, primarily in the Palen and Chuckwalla Mountains. These have produced a number of precious and base metals, including iron (magnetite) and pyrophyllite. Minor gold, silver, copper and uranium prospects are located in the Palen Mountains northeast of the site. The Black Jack Mine in the northern McCoy Mountains about 16 miles northeast of the site is known for the most productive and most extensively worked manganese mine in Southern California. This manganese mine was active during war times and in the 1950s to produce several thousand tons of manganese. This area is within the approximately 1.4-square-mile surface area of Ironwood Manganese District. Other mining areas, including the Blue Bird Mine area, St. John Mine area, and George Mine area, are also located in the northern McCoy Mountains and have produced manganese, copper, and a small amount of silver and gold in the past. Uranium has been claimed in the southern McCoy Mountains about 22 miles east of the site with reported past production by Caproci-Woock Groups. There are several other prospective or claim areas for minerals in the McCoy Mountains including manganese, copper, silver, gold, and uranium. The Roosevelt and Rainbow group of mines in the Mule Mountain district, also known as the Hodges Mountain district that is located about 26 miles southeast of the site, have produced some gold and copper from the quartz veins in granitic rocks. (Ex. 2000, p. 5.2-18.)

The nearest oil and gas fields are located more than 150 miles west of the PSEGS site in the Los Angeles Sedimentary basin. The nearest geothermal field is located at Brawley just south of the Salton Sea in the Imperial Valley basin about 40 miles southwest of the site. (Ex. 2000, p. 5.2-18.)

Several gravel borrow pits are present along I-10 south of the site, and the presence of alluvial fan materials at the proposed project location means that the property could potentially be accessed and developed as a source of salable sand and gravel resources. During construction, the project owner may need or desire to move sand and gravel either off-site or between the different units of the facility. Should this occur, the project owner would be required to comply with the BLM regulations in 43 CFR part 3600, which regulates the production and use of sand and gravel from public lands. Use of sand and gravel or other mineral materials within the boundaries of an authorized ROW is permitted; however, removal of these materials from an authorized ROW would require payment to the United States of the fair market value of those materials. (Ex. 2000, p. 5.2-18.)

### **Paleontologic Resources**

Review of previous paleontological research conducted in the PSPP vicinity showed that the region is poorly understood. Very few comprehensive studies have taken place and few finds have been reported to local museums. The information reviewed indicates there are no recorded fossil collection sites within the proposed project boundaries or within a one mile radius. Three vertebrate fossil collection areas have been documented in the proposed project area within the same or similar sedimentary units that underlie the site. One location east-southeast of the site between I-10 and Ford Dry Lake contained fossil remains of a pocket mouse. Another site northwest of the proposed project site in the northern Chuckwalla Valley yielded fossil remains of tortoises, horses, camels, and llamas. (Ex. 2000, p. 5.2-19.)

More recently, there has been an influx of paleontological information associated with the large energy projects proposed and under construction in the Chuckwalla Valley and the Palo Verde Mesa. Originally, the low number of finds in the project vicinity was interpreted as an indication of low sensitivity. However, paleontological field survey and construction monitoring associated with these large projects in the last decade have consistently identified significant paleontological resources in both surface and buried contexts. For example, during construction of the Genesis Solar Energy Project paleontological monitors have found multiple vertebrate fossils, primarily tortoise carapace and bones. (Ex. 2000, p. 5.2-19.)

Initial studies conducted for the nearby Desert Sunlight Project originally deemed the site to be of low probability for encountering vertebrate fossils (low sensitivity). However since the recent breaking of ground, several specimens (identifiable fragments or individual bones) and numerous unidentifiable fragments have been found. The identifiable species include Smilodon (carpels, metacarpels, and distal end of ulna), a phalange of an undetermined cervidae sp., a camilid, tortoise, and several partials of small mammals and rodentia. The results of these recent studies suggest that the

Chuckwalla Valley is more paleontologically sensitive than originally believed. (Ex. 2000, p. 5.2-19.)

Multiple studies have identified paleosols (old soil horizons) within the Quaternary alluvium of the region. These horizons formed slowly through mechanical and chemical erosion during wetter periods in the Late Pleistocene of the Colorado Desert. These conditions are very favorable for the preservation of fossils, especially short-lived species such as rodents. These paleosols have been identified below desert pavement in the southern Chuckwalla Valley, south of I-10 near State Route 177, and at the Rio Mesa Solar Energy Generating Facility. (Ex. 2000, p. 5.2-19.)

Near-surface geology beneath the PSEGS site consists primarily of Quaternary alluvium, eolian and lacustrine sediments, which increase in age with depth from Holocene at the surface to Pleistocene and older at depth. Coarse-grained sediments grade laterally and are inter-bedded with lakebed deposits of similar ages. Pleistocene age older alluvium, which is exposed along the southwestern boundary of the site, underlies younger alluvium and lacustrine sediments. Older alluvium would likely be buried at progressively deeper depths beneath Holocene sediments to the northeast across the site. (Ex. 2000, pp. 5.2-19 - 5.2-20.)

The results of a site-specific comprehensive surficial field survey recorded one non-significant fossil occurrence that yielded a non-diagnostic vertebrate material within the project limits. The specimen was discovered on the ground surface and was considered to have been *ex-situ* (i.e. removed from its original place of fossilization) and transported an unknown distance and re-deposited on top of alluvial sediments. As a result of this interpretation, the fossil resource discovered on the surface within the limits of the project was not considered significant. However, recent paleontological research in the site region suggests that “specimens that might be regarded as *ex-situ* have not moved laterally and only moved a slight amount vertically.” This alternative interpretation would indicate the likely presence of fossils beneath the location where the specimen was recovered. (Ex. 2000, p. 5.2-20.)

The Riverside County Transportation and Land Management Agency (TLMA) has produced a paleontological sensitivity map of the County. The mapping indicates that areas underlain by Playa Lake, eolian and younger alluvial deposits within and around the Palen Dry Lake basin have a high paleontological sensitivity rating. Younger alluvium upslope from the lake bed has a low-sensitivity rating, and older alluvium is assigned an undetermined sensitivity rating according to the TLMA. (Ex. 2000, p. 5.2-20.)

Based on the above information, the paleontological resource sensitivity of undisturbed Quaternary alluvium and lacustrine sediments varies from low at depths less than 1.5 feet, to high at depths below 1.5 feet. Since the depth to Pleistocene age sediments

beneath Holocene deposits is unknown, Staff argues that all sediments beneath disturbed ground should initially be treated as highly sensitive. Where these units are mapped at the surface or may be present near the surface adjacent to these mapped areas, specifically along the northern and southern borders of the site, paleontological monitoring should be conducted during any excavation activity. Since the depth to Pleistocene age alluvial and lacustrine deposits is undetermined at present for the remainder of the site, Staff recommends that any excavations that penetrate below 1.5 feet of the existing ground surface should be treated as having a high potential for impacting significant paleontological resources and would require paleontological monitoring. This depth is based on observations of possible older alluvium encountered in excavations advanced for the geomorphic reconnaissance report. This depth would likely increase from the northern and southern boundaries towards the center of the PSEGS site. After subsurface field exploration, and monitoring of grading and trenching activities during proposed construction of the site, a qualified professional paleontologist could determine the appropriate depth above which the coarse and fine grained soils are Holocene in age, have a low sensitivity, and low potential for adverse impacts on paleontological resources. Staff states that where pylons are driven into soils with high sensitivity, the potential for adverse impacts on paleontological resources is undetermined. (Ex. 2000, p. 5.2-20.)

Existing Conditions of Certification **PAL-1** to **PAL-8** are designed to mitigate paleontological resource impacts resulting from conventional excavation operations as discussed above to less-than-significant levels. These conditions would essentially require a worker education program in conjunction with the monitoring of earthwork activities by the PRS assigned to the project. (Ex. 2000, p. 5.2-21.)

Staff maintains that adverse impacts to paleontological resources are likely to occur in areas where heliostats are to be supported by pylons that are vibro-inserted or pre-augured and vibro-inserted into the ground. Staff recommends a subsurface paleontological characterization where heliostat pylons are proposed to mitigate for the potential impacts to paleontological resources in the subsurface soils. We discuss this recommendation in the next section. (Ex. 2000, p. 5.2-21.)

### **Construction Impacts and Mitigation**

The design level geotechnical evaluation, required for the project by the CBC (2010) and existing Condition of Certification **GEO-1**, should provide standard engineering design recommendations for mitigation of earthquake ground shaking, i.e., excessive settlement due to dynamic compaction and hydrocompaction, and potentially expansive soils. (Ex. 2000, p. 5.2-21.)

Construction of the PSEGS project would directly remove approximately 3,794 acres from potential use for sand and gravel production under the BLM's salable mineral

program. In general, sand and gravel resources are widely available throughout the region. The primary consideration in the economic viability of sand and gravel operations is the transportation cost, which is driven by the proximity of the operation to its point of use. Although there is likely to be widespread development in the Chuckwalla Valley that would require sand and gravel resources, the site represents a small fraction of the total sand and gravel resource available within the valley such that removal of the 3,794 acre area from potential production is not expected to have any significant impact on potential future development. As a result, the PSEGS would not impact any current or reasonably foreseeable development of geologic resources. However, during construction, the project owner may need or desire to move sand and gravel either off-site or between the different units of the facility. Should this occur, the project owner would be required to comply with the BLM regulations in 43 CFR, part 3600, which regulates the production and use of sand and gravel from public lands. Use of sand and gravel or other mineral materials within the boundaries of an authorized ROW is permitted; however, removal of these materials from an authorized ROW would require payment to the United States of the fair market value of those materials. (Ex. 2000, p. 5.2-21.)

The PSEGS project would not have any direct or indirect impact on the production of locatable or leasable minerals outside of the project boundaries. Although mineral occurrences have been claimed in the vicinity of the PSEGS site, there are no indications that these could become economic commercial operations. If they become economic operations, the existence of the PSEGS facility is not expected to interfere with the ability of the claimant to access those minerals. The only potential conflict would occur if the claimant or another person locates a new claim within the project boundaries. This could occur because the project location has not been withdrawn from mineral entry; however, the potential for this scenario is low. If it did occur, conflicts between the surface use of the land for solar energy production and access to the subsurface minerals would be resolved in accordance with federal and Riverside County land use regulations. Therefore, the PSEGS will not impact any current or reasonably foreseeable development of mineral resources. (Ex. 2000, pp. 5.2-21 – 5.2-22.)

Significant paleontological resources have been documented in older alluvium deposits that are present in the general area of the project. Existing studies led Staff to conclude that the soils beneath the solar field are likely to contain Pleistocene age vertebrate fossils. Construction of the PSEGS project will include grading, foundation excavation, utility trenching, pylon insertion and possibly drilled shafts. Staff considers the probability of encountering paleontological resources to be generally high on portions of the site based on the soils profile, SVP assessment criteria, and the near surface occurrence of the sensitive geologic units. The potential for encountering fossils hosted

in Quaternary alluvium will increase with the depth of cut. Excavations for ancillary facilities and new pipelines and on-site excavations that penetrate surficial Holocene age alluvium would have a higher probability of encountering potentially high sensitivity materials, although sensitive materials could occur nearer the surface. (Ex. 2000, p. 5.2-22.)

Conditions of Certification **PAL-1** to **PAL-8** are designed to mitigate potential impacts to paleontological resources to less-than-significant levels in areas where conventional excavation operations occur. These conditions of certification essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified PRS. In addition, the Petitioner proposed paleontological monitoring of geotechnical borings within the solar field in an attempt to assist with the evaluation of the paleontological sensitivity where pylons will be inserted. We agree that the monitoring of the borings will be useful in further delineating sensitive paleontological resources and therefore impose Condition of Certification **PAL-5**. (Ex. 2000, p. 5.2-22.)

Earthwork would be halted any time potential fossils are recognized by either the paleontologist or the worker. For finds deemed significant by the PRS, earthwork cannot restart until all fossils in that strata, including those below the design depth of excavation, are collected. These conditions of certification would yield a net gain to the science of paleontology since fossils that would not otherwise have been discovered can be collected, identified, studied, and properly curated. A PRS will be retained for the project by the project owner to produce a monitoring and mitigation plan, conduct the worker training, and oversee the monitoring. (Ex. 2000, p. 5.2-23.)

During the excavation monitoring, the PRS can and often does petition the Energy Commission for a change in the monitoring protocol. Most commonly, this is a request for less monitoring after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor. In the case of the PSEGS site, the PRS would determine an appropriate depth above which undisturbed alluvial deposits are Holocene in age, have a low paleontological sensitivity, and have little chance of containing significant fossils. The PRS could then recommend decreased monitoring for excavations above that depth. Paleontological sensitivity of Pleistocene age sediments below the determined depth would remain high and would require continued monitoring. Based upon the literature and archives search, field surveys, and compliance documentation for the PSEGS, the project owner has proposed monitoring and mitigation measures to be followed during the excavation stage of project construction. (Ex. 2000, p. 5.2-23.)

Staff argues that “existing information indicates that site soils have a high probability of containing fossils,” based upon the PSPP’s AFC, FSA, and DEIS as well as the Petition

to Amend (Ex. 1003). (Ex. 2000, p. 5.2-10, 10/28/13 RT 229:24 – 230:1.) Staff accurately testified that the PSPP project proposed substantial site grading and excavation such that fossils encountered during construction would have been uncovered, discovered, collected and recorded, thereby contributing to the scientific understanding of the paleoclimate and paleobiology of the area. (Ex. 2000, p. 5.2-10.)

Staff's main objection arises from the elimination of the massive grading that was required for the PSPP construction. Instead, the PSEGS project would install, using vibro-insertion methods, 170,000 individual pole structures (pylons) to support heliostat mirrors. Each pylon would be driven through the soil to a final depth of approximately 12 feet below ground surface. Staff's point of contention is that this method of construction does not utilize excavation so there would be no retrieval of subsurface soils or any fossils contained within those soils. Staff claims that any fossils that are in the path of pylon insertion would be "permanently destroyed with no recovery, discovery or scientific benefit realized." Therefore, Staff argues the use of this technology would result in a significant impact. (Ex. 2000, p. 5.2-10.) By the same token, Staff acknowledges that there has been "no subsurface exploration conducted on the Palen site so you can't really rule anything in or out." (10/28/13 RT 220:20-22.)

Petitioner provided substantially more factual information regarding the likelihood of the presence of fossils on site and the practicalities of vibro-insertion of heliostats. Petitioner's expert clarified that the heliostat pylons will be eight inches in diameter and will extend into underlying sediments to depths of only four feet in most areas and up to eight feet in areas of potential scour such as washes. (Ex. 1060, pp. 29-30; 10/28/13 RT 212:20-219:11.)

To refute Staff's assertion of a high probability of fossil presence on site, Petitioner's expert described two 200-foot long trenches that were recently excavated in the power block areas to depths of four feet each. These trenches exposed Pleistocene alluvial fan sediments at depths varying from 28 to 40 inches below the existing surface. These sediments were highly oxidized high-energy sediments that have been modified by pedogenesis (soil formation). A zone of calcium carbonate accumulation resulting from pedogenesis occurred 6 to 14 inches below the eroded upper surface of the deposits. Petitioner's expert concluded that the combination of pedogenesis, oxidation, soluble salt movement and precipitation indicate that the Pleistocene sediments have a low probability of vertebrate fossil preservation. Examination of the geological and stratigraphic relationships in natural exposures in the general area show that the vast majority of the project area contains conglomerates at the surface or at shallow depths, and that there are few, if any, locations within the project footprint where "Pleistocene sediments considered to have a high probability of containing fossils" lie within 1.5 feet of the surface. (Ex. 1060, pp. 29-30.)

Petitioner's expert conceded that fossils could be encountered by the pylons without knowledge of encounter or damage. However, he testified that the emplacement of the 8-inch diameter pylons for the entire field will disturb a total surface area of only 1.4 acres, thus the disturbance over the total area of the project is less than 0.04 percent of the total facility area. Further, it is conservatively estimated that less than 20 percent of the total project area has any possibility of encountering anything other than coarse-grained fanglomerates within a depth of four to eight feet. Thus, less than 0.01 percent of the pylons have any realistic probability of encountering significant fossils. Given the frequency of fossil recovery in the previous paleontological survey, the probability of damaging buried fossil remains is astronomically small. (Ex. 1060, p. 30.) With the imposition of the Reduced Acreage Alternative, the total impact would be reduced by half.

At the hearing, Petitioner's expert explained how the PSEGS project's impacts to paleontological resources would be substantially less than those of the PSPP. He testified that the PSPP required 4.5 million cubic yards of earth displacement compared to the 200,000 cubic yards that the PSEGS would displace. The total volume of earth displaced by the pylon vibro-insertion would be approximately 22,000 cubic yards, which Petitioner's expert testified was about 35 thousandths of 1 percent (0.035%) of the total volume of the footprint area to a depth of eight feet. (10/28/13 RT 218:19-219:3.) Again, with the imposition of the Reduced Acreage Alternative, the total impact would be further reduced by half.

Staff's expert was unable to estimate the percentage of fossils that would be observable to a monitor at a site using traditional construction earth movers because he was not a paleontological monitor and "just did not know." (10/28/13 RT 227:19-228:22.) Petitioner's witness testified that he had done cultural resource monitoring, which is very similar to paleontological monitoring. He guessed that 20 to 25 percent of fossil remains would be visible in graded soil if they happened to fall into the monitor's line of sight. (10/28/13 RT 232:4-20.) Petitioner argues that even if half (50 percent) of the fossils contained in displaced soil were observed by the paleontological monitor during construction of the PSPP, then over 2 million cubic yards of graded soil would go "unobserved." Further, Petitioner points out that the PSEGS would move approximately 200,000 cubic yards of earth so that, again assuming a monitor can observe half of the fossils in the displaced soil, there would still remain 100,000 cubic yards of unobserved soil. By adding the 22,000 cubic yards of earth displaced by pylon installation to the 100,000 cubic yards of unobserved graded soil, Petitioner argues that the sum of all unobserved PSEGS soil still amounts to a 95 percent decrease in unobserved material compared to the PSPP. (Petitioner's Opening Brief, pp.34-35.)

Staff recommends Condition of Certification **PAL-9** to mitigate for the potential impacts to paleontological resources by requiring subsurface excavations to determine the

extent of paleontological resources at the site. (Ex. 2000, pp. 5.2-10 and 5.2-22 – 5.2-23.) Intervenor CRIT objects to the inclusion of Condition of Certification **PAL-9**, because these activities would require significant ground disturbance for the sole purpose of collecting paleontological information that would put buried cultural materials at unnecessary risk. (CRIT Opening Brief, p. 12, fn. 8.) Petitioner objects to Condition of Certification **PAL-9** claiming that extensive exploration for paleontological resources in most of the proposed PSEGS footprint is “unlikely to be productive, onerously expensive, and time-consuming.” (Ex. 1060, p. 30.)

Although the insertion of posts could result in destruction of unknown paleontological resources, the evidence shows that PSEGS’ overall impacts to unknown resources are far less severe than those of the approved PSPP project. Staff points out that more disturbed resources would have been exposed and available for study from the PSPP’s proposed mass grading than would be exposed due to the reduced mass grading and pylon insertion of the amended PSEGS project. Staff’s proposal favors maximizing the availability of disturbed paleontological resources for study (either because they were exposed during construction or through surveys and sampling) over simply leaving these resources where they lie. Condition of Certification **PAL-5** enables staff to achieve a similar goal with substantially less intrusion.

In reviewing an amendment of an approved project, our primary focus is to determine whether any of the amended project’s impacts will be more severe than those of the approved project. According to the evidence and convincing testimony, we find that the PSEGS project would disturb or destroy fewer resources during construction than the PSPP. Accordingly, we reject Staff’s proposed Condition of Certification **PAL-9**. Implementation of this condition would result in the disturbance of resources that would not otherwise be disturbed due to the reduction in mass grading. Furthermore, the reduced footprint and reduction in mass grading would result in a substantial increase in undisturbed areas, preserving any paleontological resources *in situ* in those areas. We find that the PSEGS’ impact to some unknown quantity of possible fossils due to the vibro-insertion of eight inch pylons in an area covering less than 0.04 percent of the total facility area is less than significant. With the imposition of the Reduced Acreage Alternative, the total impact would be further reduced by half.

### **Operation Impacts and Mitigation**

Operation of the PSEGS project would not have any adverse impact on geologic, mineralogical, or paleontological resources because significant additional ground disturbance would not occur. Since the CBC (2010) requires that the facility be designed to withstand strong ground shaking, impacts due to seismic events should not significantly impact the structural integrity or operation of the facility. (Ex. 2000, p. 5.2-23.)

## **Non-Operation and Facility Closure Impacts and Mitigation**

The future non-operation and facility closure of the project would not negatively affect geologic, mineralogical, or paleontological resources since the ground disturbed during plant facility closure would have been already disturbed and mitigated as required during construction and operation of the project. (Ex. 2000, p. 5.2-24.)

### **CUMULATIVE IMPACTS**

The **PROJECT DESCRIPTION** section provides information on the potential cumulative solar and other development projects in the project area. Together, these existing, proposed and potential projects comprise the cumulative scenario that forms the basis of the cumulative impact analysis for the PSEGS project. (Ex. 2000, p. 5.2-24.)

These projects are defined within a geographic area that has been identified by the Energy Commission and the BLM as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects have, are, or will be required to undergo their own independent environmental review under CEQA and/or NEPA. Even if the cumulative projects described in the **PROJECT DESCRIPTION** have not yet completed the required environmental processes, they were considered in this cumulative impact analysis. (Ex. 2000, p. 5.2-24.)

### **GEOGRAPHIC SCOPE OF ANALYSIS**

The geographic extent of potential impact to geologic, mineralogical, and paleontological resources would be generally limited to the PSEGS site. Potential cumulative effects as they pertain to geologic hazards are essentially limited to regional subsidence due to groundwater withdrawal. Impacts associated with strong ground shaking and dynamic compaction are not cumulative in nature and would not add to potential cumulative impacts to the facility. (Ex. 2000, p. 5.2-24.)

### **Effects of Existing Projects**

Historic groundwater withdrawals on the order of 48,000 AFY and associated impacts to ground water levels did not result in any documented subsidence in the project area, even with increases in effective stress on clay layers present at depth. During operation, the PSEGS would consume approximately 201 AFY, which is not expected to significantly affect regional subsidence in the geographic area. Additional groundwater information is contained in the **SOIL AND WATER RESOURCES** section of this Decision. (Ex. 2000, pp. 5.2-25 - 5.2-26.)

Paleontological resources have been documented in the general area of the project. As the value of paleontological resources is associated with their discovery within a specific geologic host unit, the potential impacts to paleontological resources due to conventional excavation construction activities will be mitigated as required by

Geological and Paleontological Resources

Conditions of Certification **PAL-1** through **PAL-8**. Implementation of these conditions should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. Cumulative impacts, in consideration with other nearby similar projects, should be either neutral (no fossils encountered) or positive (fossils encountered, preserved, and identified). Construction associated with past and present projects could add to fossil discoveries that would enhance our understanding of the prehistoric climate, geology, and geographic setting of the region for the benefit of current and future generations. (Ex. 2000, p. 5.2-26.)

## **EFFECTS OF REASONABLY-FORESEEABLE FUTURE PROJECTS**

### **Foreseeable Projects in the Project Area**

Several future foreseeable projects identified in **PROJECT DESCRIPTION - Tables 2, 3 and 4** are located within the Chuckwalla Valley. Such projects would most likely include ground water pumping of similar magnitude to the PSEGS; however, the combined effect of these projects would still result in much less than the historic rate of 48,000 AFY, which did not result in any documented regional subsidence, such that significant impacts to regional subsidence would not be expected. Therefore, there would be no significant cumulative contribution to regional subsidence from foreseeable renewable projects in the Chuckwalla Valley. Additional information on ground water withdrawal is contained in the **SOIL AND WATER RESOURCES** section of this Decision. (Ex. 2000, p. 5.2-25.)

### **Contribution of the PSEGS to Cumulative Analysis**

#### Construction

The construction of the PSEGS is not expected to require any significant amount of groundwater pumping such that impacts to regional subsidence are not expected. Sand and gravel resources are present at the site and could be used during construction to minimize importation of such materials from other commercially-available sources in the area, thereby minimizing impacts to current commercially-available sand and gravel resources. In addition, sand and gravel resources are present throughout the regional area. Therefore, construction of the PSEGS would not impact any reasonably-foreseeable development of sand and gravel resources. (Ex. 2000, p. 5.2-26.)

The construction of the PSEGS would include excavation and grading at the site. Proper monitoring of excavations at the PSEGS facility during construction could result in fossil discoveries, which would enhance our understanding of the prehistoric climate, geology, and geographic setting of the region for the benefit of current and future generations. Construction of the PSPP has the potential to result in the destruction of sub-surface paleontological resources via breakage and crushing related to ground-

disturbing activities that have the potential to adversely affect an unknown quantity of fossils that may occur on or underneath the surface in areas containing paleontological sensitive geologic units. Potential impacts to paleontological resources will be mitigated through worker training and monitoring by qualified paleontologists as required by Conditions of Certification **PAL-1** through **PAL-8** in areas where soils are exposed by conventional excavation operations. (Ex. 2000, p. 5.2-26.)

Where heliostat pylons are vibro-inserted into soils, some fossils will be destroyed with no opportunity for discovery or recovery. However, the relatively-small total area of impact to paleontological resources due to pylon insertion renders this impact less than significant. The evidence establishes the recovery of fossils in the course of conventional site construction far outweighs the potential for fossils to be damaged from pylon insertion. Therefore, potential impacts from vibro-insertion of pylons is not cumulatively considerable. (Ex. 2000, pp. 5.2-26 – 5.2-27.)

#### Operation

The operation of the PSEGS is expected to result in increased annual groundwater pumping in the geographic area, from the current 2,000 AFY to approximately 2,200 AFY. Historic groundwater withdrawals on the order of 48,000 AFY did not result in any documented subsidence in the PSEGS project area. Since operation of the PSEGS would only contribute a minor amount of groundwater withdrawal to the overall amount in the Chuckwalla Valley and since this cumulative amount is only a fraction of historic pumping levels that did not result in any documented subsidence, operation of the PSEGS will not cause a cumulatively-considerable impact to regional subsidence in the Chuckwalla Valley. (Ex. 2000, p. 5.2-27.)

Operation of the PSEGS will not require any significant excavation or grading such that impacts to geologic, mineralogical, and paleontological resources will not be cumulatively considerable. (Ex. 2000, p. 5.2-27.)

#### Non-operation and Facility Closure

Non-operation and facility closure of the PSEGS will not require any significant amount of groundwater pumping such that impacts to regional subsidence would not be cumulatively considerable. In addition, potential sand and gravel resources would become available again following the facility closure. (Ex. 2000, p. 5.2-27.)

Closure of the project will not negatively affect geologic, mineralogical, or paleontological resources since the ground disturbed during facility closure would have been already disturbed and mitigated as required during construction and operation of the project. As a result, facility closure of the PSEGS would not contribute to cumulative impacts to geologic, mineralogical, and paleontological resources, but rather would make existing sand and gravel resources available and would allow for potential

procurement of paleontological resources that would otherwise remain unknown. (Ex. 2000, p. 5.2-27.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

Federal, state, or local/county LORS applicable to the geological and paleontological resources affected by the PSEGS project are detailed in **Appendix A**. The project as designed will cause the least disturbance to geological and paleontological resources. Construction and operation of the PSEGS project would comply with all applicable LORS regarding impacts in the area of geology and paleontology. (Ex. 2000, p. 5.2-11.)

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Applicant, or Intervenor. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

### **BENEFITS**

The science of paleontology is advanced by the discovery, study and curation of new fossils. These fossils can be significant if they represent a new species, verify a known species in a new location and/or if they include parts of similar specimens that had not previously been found preserved. In general, most fossil discoveries are the result of excavations either purposeful in known or suspected fossil localities, or as the result of excavations made during earthwork for civil improvements or mineral extraction. Proper monitoring of excavations at the proposed PSEGS facility, in accordance with an approved Paleontological Monitoring and Mitigation Plan, could result in fossil discoveries that would enhance our understanding of the prehistoric fossil record, or the climate, geology, and geographic setting of the region for the benefit of current and future generations. (Ex. 2000, p. 5.2-28.)

### **PUBLIC COMMENT**

There were no comments received from the public regarding the geological and paleontological resources.

## FINDINGS OF FACT

Based upon the evidence, we make the following findings:

1. The main geologic hazards at this site include strong ground shaking, hydro-compaction, dynamic compaction, and corrosive soils.
2. These potential hazards can be effectively mitigated through facility design by incorporating recommendations contained in a design-level geotechnical report as required by the California Building Code (CBC 2007) and Condition of Certification **GEO-1** as well as conditions of certification found in the **FACILITY DESIGN** section of this Decision.
3. The PSEGS project area is currently not used for mineral production, nor is it under claim, lease, or permit for the production of locatable, leasable, or salable minerals.
4. Sand and gravel resources are not only present at the site but are also available throughout the regional area.
5. PSEGS should not have a significant impact on the availability of sand and gravel resources.
6. There are no other known geological or mineralogical resources at the PSPP site.
7. Paleontological resources have been documented in older Quaternary alluvium similar to that located on the project site.
8. Potential impacts to paleontological resources would be mitigated through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification **PAL-1** through **PAL-7**.
9. The potential for intense levels of earthquake-related ground shaking and settlement due to earthquake are geologic hazards that could affect the PSEGS project.
10. The evidentiary record contains a geotechnical evaluation and presents standard engineering design recommendations for mitigation of seismic shaking and site soil conditions applicable to the project site.
11. Potential geologic hazards to the project are effectively mitigated by standard engineering design measures as specified in Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** of the **FACILITY DESIGN** section of this Decision.
12. The evidence establishes that there is a low potential for significant adverse impacts to the PSEGS project from geologic hazards during its design life.

13. The evidence establishes that there is a low potential for significant adverse impacts to geologic, mineralogical, and paleontological resources from the construction, operation, and closure of the PSEGS project.
14. Liquefaction, lateral spreading, dynamic compaction, hydrocompaction, subsidence, expansive soils, corrosive soils, landslides, flooding, tsunamis, seiches, and volcanic hazards pose low or negligible risks to the PSEGS project.
15. The proposed PSEGS project site is located within an established Mineral Resource Zone (MRZ) 4 and no economically-viable mineral deposits are known to be present at the site.
16. There is no evidence of known active faults or potential geological or mineralogical resources at the project site or along the linear alignments.
17. Project construction-related mass grading, deep foundation excavation, and utility trenching that penetrates underlying undisturbed soils holds a high potential for exposure of paleontological resources until determined otherwise by the project PRS.
18. The project owner will implement several mitigation measures to avoid impacts to any paleontological resources discovered, including worker education, preparing a Paleontological Monitoring and Mitigation Plan, and having a PRS on site as required by Conditions of Certification **PAL-1** through **PAL-7**.
19. The facility can be designed and constructed to minimize the effect of geologic hazards and impacts to potential paleontological resources at the site during project design life.
20. PSEGS' overall impacts to unknown paleontological resources are far less severe than those of the approved PSPP project.
21. PSEGS' impact to some unknown quantity of possible fossils due to the vibro-insertion of eight-inch pylons in an area covering less than 0.04 percent of the total facility area is less than significant.
22. No geologic hazards which would arise due to cumulative effects during operation of the proposed facility were identified during this investigation.
23. PSEGS will not require any significant excavation or grading such that impacts to geologic, mineralogical, and paleontological resources will not be cumulatively considerable.
24. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## CONCLUSIONS OF LAW

1. Implementation of the conditions of certification listed below ensures that the PSEGS will not result in any significant direct, indirect, or cumulative adverse impacts to geologic, mineralogical, and paleontological resources.
2. With implementation of the conditions of certification below, the PSEGS Project will comply with all applicable LORS related to geologic, mineralogical, and paleontological resources as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.
3. Proper monitoring of excavations at the proposed PSEGS facility, in accordance with an approved Paleontological Monitoring and Mitigation Plan, could result in fossil discoveries that would enhance our understanding of the prehistoric fossil record, or the climate, geology, and geographic setting of the region for the benefit of current and future generations.
4. There has been a substantial change in circumstances since the original approval because at the time of the original licensing, the project was wholly-owned by Solar Millenium. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

## CONDITIONS OF CERTIFICATION

**GEO-1** The Soils Engineering Report required by section 1803 of the 2010 CBC should specifically include laboratory test data, associated geotechnical engineering analyses, and a thorough discussion of potential hydro-compaction or dynamic compaction; the presence of expansive clay soils; and the presence of corrosive soils. The report should also include recommendations for ground improvement and/or foundation systems necessary to mitigate these potential geologic hazards, if present.

**VERIFICATION:** The project owner shall include in the application for a grading permit a copy of the Soils Engineering Report that addresses the potential for liquefaction, settlement due to compressible soils; ground-water withdrawal, hydro-compaction or dynamic compaction and the possible presence of expansive clay soils; and a summary of how the results of the analyses were incorporated into the project foundation and grading plan design for review and comment by the Chief Building Official (CBO). A copy of the Soils Engineering Report, a copy of the application for grading permit, and any comments by the CBO are to be provided to the CPM at least 30 days prior to grading.

**PAL-1** The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of the PRSs for review and approval. If the approved PRS is replaced prior to completion of project mitigation and

submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified paleontological resource monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;
2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. At least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified PRMs to monitor as he or she deems necessary on the project. PRMs shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

**VERIFICATION:** At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

1. At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating

that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than 1 week prior to the monitors beginning on-site duties.

2. Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

**PAL-2** The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay-down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet. If the footprint of the project or its linear facilities changes, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week and until ground disturbance is completed.

**VERIFICATION:** At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

**PAL-3** The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and

specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;
3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;
6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare,

remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and
10. A copy of the paleontological conditions of certification.

**VERIFICATION:** At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS and acceptance of the PRMMP by the project owner evidenced by a signature.

**PAL-4** Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen, and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of an initial in-person PRS training or may utilize a CPM-approved video or other presentation format during the project kick off for those mentioned above. Following initial training, a CPM-approved video or other approved training presentation/materials, or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;

2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP Certification of Completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

**VERIFICATION:**

1. At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures for workers to follow.
2. At least 30 days prior to ground disturbance, the project owner shall submit the training program presentation/materials to the CPM for approval if the project owner is planning to use a presentation format other than an in-person trainer for training.
3. If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.
4. In the Monthly Compliance Report (MCR), the project owner shall provide copies of the WEAP Certification of Completion forms with the names of those trained and the trainer or type of training (in-person or other approved format) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

**PAL-5** The project owner shall ensure that the PRS and PRM(s) monitor, consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines

full-time monitoring is not necessary in locations that were identified as potentially fossil bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the MCR. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.
2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event, where construction has been halted because of a paleontological find.
5. The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the MCRs. The summary will include the name(s) of PRS or PRM(s) active during the month; general descriptions of training and monitored construction activities; and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have

been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

**VERIFICATION:** The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

**PAL-6** The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

**VERIFICATION:** The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of 3 years after project completion and approval of the CPM-approved Paleontological Resources Report (PRR) (see Condition of Certification **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

**PAL-7** The project owner shall ensure preparation of a PRR by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information and submit it to the CPM for review and approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials, a map showing the location of paleontological resources encountered, determinations of sensitivity and significance, and the PRS' description of sensitivity and significance of those resources.

**VERIFICATION:** Within 90 days after completion of ground-disturbing activities including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

**PAL-8** The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection

of fossil material, preparation of fossil material for analysis, analysis of fossils, identification and inventory of fossils, preparation of fossils for curation, and delivery for curation of all significant paleontological resource materials encountered and collected during project construction. The project owner shall pay all curation fees charged by the museum for fossil material collected and curated as a result of paleontological mitigation. The project owner shall also provide the curator with documentation showing the project owner irrevocably and unconditionally donates, gives, and assigns permanent, absolute, and unconditional ownership of the fossil material.

**VERIFICATION:** Within 60 days after the submittal of the PRR, the project owner shall submit documentation to the CPM showing fees have been paid for curation and the owner relinquishes control and ownership of all fossil material.

**PAL-9 DELETED**

## VII. LOCAL IMPACT ASSESSMENT

In the following sections of this Decision, we review whether the Palen Solar Electric Generating System (PSEGS or “project”) will result in significant local impacts such as public health or safety hazards, adverse traffic or visual effects, unmitigated noise, or an excessive burden on local community services. These potential impacts are discussed under the technical topics of **LAND USE, TRAFFIC AND TRANSPORTATION, SOCIOECONOMICS, NOISE, and VISUAL RESOURCES.**

### A. LAND USE

#### DESCRIPTION OF CHANGES

The amended project (PSEGS) includes replacing the parabolic trough solar collection system with solar tower technology that will occupy the same location as the certified project (Palen Solar Power Plant (PSPP)). The project would continue to interconnect to the regional transmission grid at Southern California Edison’s (SCE) Red Bluff Substation, which is currently under construction. The PSEGS is comprised of two adjacent solar fields and associated facilities with a total combined nominal output of approximately 500 MW. Palen Solar Holdings (PSH) proposes to develop the PSEGS in two operational units, each consisting of one solar field, one tower, and a power block capable of producing approximately 250 MW of electricity. The PSEGS will be constructed entirely on land owned and operated by the Bureau of Land Management (BLM). (Ex. 2000, p. 4.5-3.)

The acreage for the PSEGS will be 572 acres less than the PSPP. The project area is in the “Multiple-Use Class M” land-use category. The Class M land-use category may allow electrical generation plants in accordance with federal, state, and local laws subject to approval of a California Desert Conservation Area (CDCA) Plan amendment by the BLM. (Ex. 2000, p. 4.5-1.)

The proposed power plant and overhead transmission line to serve the project each require the BLM’s approval of a right-of-way (ROW) grant and two CDCA Plan amendments; one amendment for the solar facility and one to allow the project’s transmission line to be constructed outside of a designated corridor. With the BLM’s approval of the ROW grant and amendments, the PSEGS and the portion of the transmission line outside of the designated corridor would be consistent with the CDCA Plan. The project owner filed a revised plan of development with the BLM on February 13, 2013. The BLM issued a Notice of Availability of the Draft Supplemental Environmental Impact Statement (SEIS) on July 26, 2013; the public comment period on the SEIS ends on October 24, 2013. The SEIS was not offered into evidence by any party, but had been docketed and given the transaction number TN 200081; therefore, it is a part of the administrative record.

Unlike the approved PSPP project, the PSEGS amendment does not involve the use of private land. Therefore, land-use related state and local laws, ordinances, regulations, and standards (LORS) identified for the PSPP are not applicable to the PSEGS, and only federal LORS apply. Condition of Certification **LAND-1** ensures that, prior to construction, the project will comply with applicable land-use related LORS. (Ex. 2000, p. 4.5-1.)

The evidence indicates that the PSEGS would not disrupt or divide an established community, or convert farmland to non-agricultural use or forest land to non-forest use. The PSEGS is not within a habitat conservation plan approved by the U.S. Fish and Wildlife Service (USFWS), or a natural community conservation plan approved by the California Department of Fish and Wildlife. The PSEGS will either not contribute to cumulative land use impacts or its incremental impacts will be less than cumulatively considerable. (Ex. 2000, p. 4.5-1.)

According to 2010 census data, there are no occupied residences and no minority or below-poverty level populations living within the six-mile buffer of the PSEGS site. Therefore, there is no environmental justice population as defined by Environmental Justice: Guidance Under the National Environmental Policy Act that would trigger further scrutiny for purposes of an environmental justice analysis. (Ex. 2000, p. 4.5-1.)

The following evidence on land use was received into evidence on October 29, 2013: Exhibits 1003, 1076, 2000, and 2008. (10/29/13 RT 38:23 – 39:12.)

### **The Certified Project's Impacts and Mitigation**

The final Energy Commission decision certifying the PSPP concluded that although implementation of the conditions of certification would attenuate the significant direct, indirect, or cumulative impacts to land use, they would not lessen all project-related visual impacts to a level of "less than significant." The decision further concluded that although the PSPP would comply with all federal, state, and local LORS pertaining to land use, PSPP's land use impacts in combination with past and foreseeable future wind and solar projects in the County of Riverside would be cumulatively considerable. Still, the PSPP Decision made a finding that specific overriding economic, legal, social, technological, and other benefits of the project outweighed the PSPP's significant effects on the environment. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp 16-17.)

Specifically, the PSPP Decision found that 40 acres of the PSPP site would be located on lands in private ownership and, therefore, would be subject to the jurisdiction of the County of Riverside. Riverside County's W-2 Zone (Controlled Development Areas) allows electrical general plants. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp. 2, 7-9, 16.)

The decision further held that the majority of the PSPP was to be located on public land (federal land) administered by the BLM and that, similar to the PSEGS project, the Petitioner applied for the required Right-of-Way grant from the BLM. The BLM continues to review the Petitioner's request. The PSPP was to be constructed within the federal CDCA Plan area that, except for the 40-acre parcel in private ownership, fell under the "Multiple-Use Class M" land use category. The Class M land use category allows electrical generation plants in accordance with federal, state, and local laws, subject to the approval of a CDCA Plan amendment by the BLM. As to the 40-acre parcel, Riverside County's W-2 Zone (Controlled Development Areas) allows electrical general plants. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp. 2-3, 16-17.)

The decision further found that the PSPP did not divide the physical arrangement of an established community or conflict with a habitat conservation plan approved by the U.S. Fish and Wildlife Service or a natural community conservation plan approved by the California Department of Fish and Game. The PSPP Decision stated that the PSPP project did not convert prime farmland or conflict with existing county zoning for agricultural use or a Williamson Act agricultural land preserve contract, or result in the conversion of farmland to a non-agricultural use or rangeland to non-rangeland use, nor did it conflict with zoning for, or cause rezoning of, forest land, timberland or land zoned "Timberland Production." The PSPP project did not result in the loss of forest land or conversion of forest land to non-forest use. The PSPP project area was not located in a designated federal wilderness area. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp 16-17.)

The decision found no regional parks or open space operated by the Riverside County Regional Park and Open Space District, or state parks within the Chuckwalla Valley; the Desert Center area has no community parks. There are no BLM designated OHV areas in Riverside County where riding off of designated open routes is permitted. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp. 7-9, 16-17.)

The PSPP Decision stated that the PSPP project, in conjunction with other proposed projects, would reduce the scenic value of wilderness areas and that these impacts on open space would be cumulatively considerable when considered in combination with other solar and wind projects proposed in the region. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, pp. 16-17.)

The decision also concluded that the PSPP project, as mitigated, was required to comply with applicable federal LORS contained in the pertinent portion of the decision. (PSPP Final Decision, CEC-800-2010-011, **LAND USE**, and **Appendix A.**)

## **The Amended Project's Impacts**

Significance criteria are based on **Appendix G** of the CEQA Guidelines, performance standards or thresholds identified in the record, as well as applicable LORS utilized by other governmental regulatory agencies.

An impact may be considered significant if the proposed project results in:

- conversion of Farmland or Forest Land;
- physical disruption or division of an established community;
- conflict with any applicable habitat conservation plan, natural community conservation plan, or biological opinion;
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction, or that would normally have jurisdiction, over the project adopted for the purpose of avoiding or mitigating environmental effects. This includes, but is not limited to, a General Plan, redevelopment plan, or zoning ordinance; or
- incremental impacts that, although individually limited, are cumulatively considerable when viewed in connection with other project-related effects or the effects of past projects, other current projects, and probable future projects.

In general, a power plant and its related facilities may also be incompatible with existing or planned land uses, resulting in potentially significant impacts, if they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses. (Ex. 2000, pp. 4.5-4 – 4.5-5.)

### **Conversion of Farm or Forest Land**

The evidence shows the PSEGS would not convert farmland. The project site and vicinity are undeveloped desert. The BLM's Master Title Plats<sup>1</sup> showing Township 5 South Range 17 East, and Township 6 South Range 17 East of the San Bernardino Meridian, California, which includes the project area, provides notations that the townships are not suitable for agriculture. While more recent land use maps show parcels are being farmed near the PSEGS site, the desert-like characteristics of the site allow us to conclude that the land is not prime or agricultural land of statewide importance. (Ex. 2000, p. 4.5-5.)

The evidence further establishes that PSEGS will not conflict with existing county zoning for agricultural use or a Williamson Act contract, or result in the conversion of

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<sup>1</sup> The BLM's Master Title Plats are the foundation of their land records. It is a drawing of the most recent survey or protraction (unsurveyed lands) by township. It is a graphic plat illustrating current federal ownership, agency jurisdiction, and rights reserved to the federal government on private land within a township (USDOI2010).

farmland to a non-agricultural use. We conclude that PSEGS will not result in a significant impact because (1) PSEGS will be constructed entirely on the BLM land and county zoning would not apply, and (2) there are no Williamson Act contracts on the BLM lands. (Ex. 2000, p. 4.5-5.)

The evidence shows that the PSEGS will not conflict with zoning for or cause rezoning of forest land, timberland, or land zoned Timberland Production. The PSEGS will be constructed on an undeveloped portion of the Colorado Desert in the eastern Chuckwalla Valley. The project area consists of relatively-undisturbed, unimproved desert dominated by sand and Sonoran creosote brush scrub. The area also has desert dry wash woodland, unvegetated ephemeral dry wash areas, and stabilized and partially stabilized desert dunes, and transmission power lines. Accordingly, we find that PSEGS will not involve other changes in the existing environment that would create a conversion of farmland or forest land and will not result in a significant impact. (Ex. 2000, p. 4.5-6.)

### **Physical Disruption or Division of an Established Community**

The unincorporated community of Desert Center (population 150) is the closest community to the project. Desert Center is approximately 10 miles west of the PSEGS site. The evidence establishes, and we find, that PSEGS will not physically disrupt or divide an existing community because it is too far from the nearest population. (Ex. 2000, p. 4.5-7.)

### **Conflict with Any Applicable Habitat Conservation Plan or Natural Community Conservation Plan**

The 3,794 acre PSEGS site is not within an approved U.S. Fish and Wildlife Service habitat conservation plan under section 10 of the Endangered Species Act, or within an approved California Department of Fish and Wildlife natural community conservation plan under section 2800 of the Natural Communities Conservation Act. We, therefore, find the PSEGS would not result in a significant impact to any applicable Habitat Conservation Plan or Natural Community Conservation Plan. (Ex. 2000, p. 4.5-7.)

### **California Desert Conservation Area**

In 1976, Congress passed the Federal Land Policy Management Act (FLPMA). In the FLPMA, Congress required the preparation of a comprehensive long-range plan for the CDCA (FLPMA, section 601). (Ex. 2000, p. 4.5-7.)

The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development, and protection of the resources and public lands within the CDCA, and it is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The plan's goals and actions for each resource are established in its 12 elements. (Ex. 2000, p. 4.5-7.)

The CDCA Plan area totals 25 million acres of which 12 million acres are administered by the BLM. The project site is located within the CDCA Plan “Multiple-Use Class M (Moderate Use)” land use category. This class may provide for electrical generation plants in accordance with state, federal, and local laws. New gas, electric, and water transmission facilities and cables for interstate communication may be allowed only within designated corridors. The Class M category is also designed to conserve desert resources and to mitigate damage to those resources that permitted uses may cause. (Ex. 2000, p. 4.5-7.)

Although the site is classified as Multiple-Use Class M, a land use amendment to the CDCA is required because the proposed use, a solar thermal electric generating facility, is not identified in the current CDCA Plan. The BLM’s approval of the ROW grant and plan amendments for the power plant and the transmission line would make the project conform to the CDCA Plan. With the BLM’s approval of the ROW grant and plan amendments, we find the PSEGS and transmission line will not result in a conflict with the CDCA Plan under this CEQA criterion and will not result in a significant adverse impact. (Ex. 2000, p. 4.5-7.)

### **Northern and Eastern Colorado Desert Coordinated Management Plan**

The PSEGS area is within the Northern and Eastern Colorado Desert Coordinated Management Plan (NECO) area. The NECO is an amendment to the CDCA Plan to make it compatible with desert tortoise conservation and recovery. The NECO is a landscape-scale planning effort for most of the California portion of the Sonoran Desert ecosystem that promotes desert tortoise conservation and recovery. The project area is within the Desert Tortoise Eastern Colorado Recovery Unit. (Ex. 2000, p. 4.5-8.)

In 1990, the desert tortoise was listed as a threatened species under the federal Endangered Species Act. By law, land managing agencies are required to review their current land use plans, adjust them as necessary, and consult on their adequacy with the U.S. Fish and Wildlife Service. (Ex. 2000, p. 4.5-8.)

The NECO designates a portion of the PSEGS area as a Multiple-Species Wildlife Habitat Management Area (WHMA). The WHMA was established to provide long-term conservation of various species of special concern. The entire PSEGS site is within a multi-species WHMA. The BLM designates portions of land under its control as Desert Wildlife Management Areas (DWMA). Approximately 1,400 feet of the proposed generation tie-line is within the Chuckwalla DWMA. The southwestern portion of the project site, natural gas line corridor, and proposed generation tie-line corridor overlap with 226 acres of the Chuckwalla Desert Tortoise Critical Habitat Unit. (Ex. 2000, p. 4.5-8.)

As indicated in the **BIOLOGICAL RESOURCES** section, without mitigation the PSEGS could contribute to the cumulatively-significant loss of biological resources within the

Chuckwalla Valley and the NECO area. The **BIOLOGICAL RESOURCES** section of this Decision imposes Conditions of Certification **BIO-9** through **BIO-11** to mitigate the loss of desert tortoise habitat. Condition of Certification **BIO-7** requires the project owner to prepare and implement a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP). The BRMIMP comprehensively describes avoidance, minimization, and mitigation measures. We find that with implementation of the conditions of certification in the **BIOLOGICAL RESOURCES** section of this decision, the PSEGS will be compatible with the NECO. (Ex. 2000, p. 4.5-8.)

### **Land Use Compatibility**

A power plant and its related facilities may also be incompatible with existing or planned land uses resulting in potentially significant impacts if they create unmitigated noise, dust, or a public health or safety hazard or nuisance; result in adverse traffic or visual impacts; or preclude, interfere with, or unduly restrict existing or future uses. According to evidence received in the following technical sections of this Decision: **NOISE AND VIBRATION; PUBLIC HEALTH; HAZARDOUS MATERIALS MANAGEMENT; TRAFFIC AND TRANSPORTATION;** and **VISUAL RESOURCES**, we conclude that the PSEGS will have no significant direct or cumulative impacts in any of these technical areas except **VISUAL RESOURCES**. (Ex. 2000, p. 4.5-8.)

As described more fully in the **VISUAL RESOURCES** section of this Decision, we have concluded that the PSEGS will result in significant unmitigable direct impacts to existing scenic resource values as seen from several viewing areas in the project vicinity and Chuckwalla Valley area (approximately a 30-mile radius from the PSEGS), including: Interstate 10 (I-10), State Route 177 (SR-177), Corn Springs Road, Joshua Tree National Park, Palen McCoy Wilderness, and Chuckwalla Mountains Wilderness. (Ex. 2000, p. 4.5-9.)

### **Cumulative Impacts**

As identified in the **PROJECT DESCRIPTION** section of this Decision, a number of projects within the region of the PSEGS have been approved, are under review, or are in operation (see **Project Description - Tables 2, 3 and 4**). The cumulative land use analysis considers past, current, and probable future projects that are relatively near the proposed project that would contribute to cumulative impacts by impacting agricultural or forest lands, disrupting or dividing an established community, conflicting with applicable land use plans, policy or regulation, or conflicting with an applicable habitat conservation plan or natural community conservation plan. (Ex. 2000, p. 4.5-9.)

As to existing projects, the eastern Chuckwalla Valley is characterized by undisturbed desert open space and wilderness, distinctive flora such as creosote bush scrub and Joshua tree, sand dunes, and mountainous terrain with large rock outcroppings. Urban and suburban development is absent and infrastructure other than energy transmission

infrastructure is very limited. Farming is limited and primarily dedicated to jojoba and palm tree production. Much of the land has been identified as desert tortoise habitat by the U.S. Fish and Wildlife Service. Land south of I-10 is within the NECO desert tortoise southern recovery unit (Eastern Colorado Recovery Unit). (Ex. 2000, pp. 4.5-9 – 4.5-10.)

Desert Center, population 150, is a focused specialty center primarily serving the commercial needs of highway travelers on I-10 and SR 177. It is an aggregation of highway service commercial-related uses clustered around the Desert Center-Rice Road interchange. The community also includes two mobile home parks, industrial/storage facilities, and a Caltrans equipment yard. (Ex. 2000, p. 4.5-10.)

The Chuckwalla Valley State Prison is located on 1,720 acres on Wiley's Well Road in Blythe. The prison provides for long-term housing and services for male felons classified as medium and low-medium inmates. It is located about 20 miles east of the PSEGS site. (Ex. 2000, p. 4.5-10.)

The Devers-Palo Verde No. 1 (DPV1) is an existing 500 kilovolt (kV) transmission line that parallels I-10. The transmission line is within a developed transmission line right-of-way within a federally-approved utility corridor.<sup>2</sup> The DPV1 was approved by the California Public Utilities Commission (CPUC) in 1979 and constructed in 1982. It is located about two miles south of the PSEGS site. (Ex. 2000, p. 4.5-10.)

The Blythe 230 kV transmission line consists of two parallel related 230 kV transmission lines that span approximately 70 miles between the Julian Hinds Substation and the Buck Substation. The transmission line project was completed in June 2010. The transmission lines were constructed within the existing federally-approved utility corridor along I-10 about two miles south of the PSEGS site. (Ex. 2000, p. 4.5-10.)

The Blythe Energy Project is a 520 MW combined-cycle, natural-gas-fired electricity-generating facility located north of I-10 and seven miles west of the California/Arizona border. It is connected to the Bucks Substation and is located about 31 miles east of the PSEGS site. (Ex. 2000, p. 4.5-10.)

The section 368 Energy Corridor<sup>3</sup> parallels I-10 and includes the existing federal utility corridor designated in the CDCA Plan. The no-default corridor width shown for the

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<sup>2</sup> The utility corridor is one of 16 utility corridors designated in the CDCA Plan of 1980, as amended.

<sup>3</sup> Section 368 of the Energy Policy Act of 2005 (the Act), Public Law 109-58 (H.R. 6), enacted August 8, 2005, directs the Secretaries of Agriculture, Commerce, Defense, Energy, and the Interior (the Agencies) to designate under their respective authorities corridors on federal land in 11 western states (Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming) for oil, gas, and hydrogen pipelines and electricity transmission and distribution facilities (energy corridors). Section 368 requires the agencies to conduct any "environmental reviews" necessary to complete the designation of section 368 energy corridors. The evaluation of future project-related environmental impacts must await site-specific proposals and the required site-specific environmental review (WECPEIS2010).

Chuckwalla Valley segment of the section 368 corridor is 10,560 feet (USDOI2009, **Table - A**). (Ex. 2000, pp. 4.5-10 – 4.5-11.)

Foreseeable future projects in the area include the Devers-Palo Verde 2 Transmission Line Project, approved by the CPUC in January 2007, which involves the construction of two parallel related 500 kilovolt electric transmission lines. The route for the Devers-Palo Verde 2 (DPV2) Transmission Line parallels the existing DPV1 transmission line route along I-10. Construction began in June 2011. The new line would be about two miles south of the PSEGS site. (Ex. 2000, p. 4.5-11.)

The Red Bluff Substation is currently under construction in the Desert Center area near I-10 within the Devers-Palo Verde transmission line corridor and was to be operational in December 2013. The substation is about six miles west of the PSEGS site and would be owned and operated by SCE. The 230/500 kV substation would allow electricity to be carried by the Devers-Palo Verde 2 transmission line. The substation also would allow interconnection of the PSEGS project and other proposed renewable energy projects in the Desert Center area. (Ex. 2000, pp. 4.5-11 – 4.5-12.)

The proposed Desert Southwest Transmission Line project consists of construction of an approximate 118-mile 500 kV transmission line and a new substation/switching station. The BLM Palm Springs-South Coast Field Office approved a ROW grant for the transmission line to cross public land between Blythe and the western end of the Coachella Valley about 24 miles east of the PSEGS site. (Ex. 2000, p. 4.5-12.)

The proposed Chuckwalla Solar 1, a 200 MW solar photovoltaic generating project, is to be constructed one mile north of Desert Center. The project is to be constructed on 4,083 acres of federal land administered by the BLM. A plan of development (POD) has been submitted to the BLM for their approval. The proposed PSEGS site is approximately six miles east of the project. (Ex. 2000, p. 4.5-12.)

The proposed Desert Lily Soleil Project, a 100 MW photovoltaic generating project on 1,216 acres, is to be located six miles north of Desert Center. The project includes a five- to eight-mile transmission line to the proposed SCE Red Bluff Substation. A POD has been submitted to the BLM for their approval. The PSEGS is approximately seven miles east of the project. (Ex. 2000, p. 4.5-12.)

The proposed Desert Sunlight Solar Farm, a 550 MW solar photovoltaic generating project, is to be located approximately five miles north of Desert Center. The project is to be constructed on 4,410 acres of the BLM administered land. A record of decision and a CDCA Plan amendment have been approved by the BLM. The PSEGS site is approximately 13.5 miles east of the project. (Ex. 2000, p. 4.5-12.)

The Genesis Solar Energy Project, a 250 MW solar parabolic trough generating project, is located north of the Ford Dry Lake Exit on I-10. The project's facility footprint would be 1,800 acres. The project was approved by the Energy Commission on October 12,

2010. The PSEGS site is approximately 12.5 miles west of the Genesis project site. (Ex. 2000, p. 4.5-12.)

Blythe Energy Project II is a 520 MW combined-cycle power plant that would be located within the Blythe Energy Project site boundary located on 30 acres of a 76-acre site. It was approved by the Energy Commission on September 23, 2010. The project would be about 31 miles east of the PSEGS site. (Ex. 2000, p. 4.5-12.)

In addition, there are some projects that have been submitted to the BLM that are currently on hold. The Eagle Mountain Landfill Project would be developed on a 4,000-acre portion of the Kaiser Eagle Mountain Mine about 17 miles north of the PSEGS site. It is currently before the U.S. Court of Appeals. Graham Pass Wind Project is a proposed 175 MW facility that would be located 15 miles south of the PSEGS site. Mule Mountain III would be a 200 MW solar photovoltaic project that would be located 22 miles southeast of the PSEGS site. Both projects are pending before the BLM. (Ex. 2000, p. 4.5-12.)

We find that the PSEGS will not divide an established community, convert farmland or forest land, is not within a habitat conservation plan or a natural community conservation plan, and will not contribute to cumulative impacts to these resources, nor will it contribute to such impacts cumulatively. The **BIOLOGICAL RESOURCES** analysis contains Conditions of Certification **BIO-9** through **BIO-11** to mitigate for the loss of desert tortoise habitat. With the implementation of **BIOLOGICAL RESOURCES** Conditions of Certification including **LAND-1**, the PSEGS will be consistent with the NECO and its impacts under land use criteria will not be cumulatively considerable.

As described more fully in the **VISUAL RESOURCES** section of this Decision, we have concluded that the PSEGS will result in significant unmitigable direct and cumulative impacts to existing scenic resource values as seen from several viewing areas in the project vicinity and Chuckwalla Valley area (an approximately 30 mile radius from the PSEGS), including I-10, SR-177, Corn Springs Road, Joshua Tree National Park, Palen McCoy Wilderness, and Chuckwalla Mountains Wilderness.

**COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant LORS applicable to hazardous materials management are contained in **Appendix A** of this Decision. Construction and operation of the PSEGS project would comply with all applicable LORS regarding long-term and short-term project impacts in the area of land use. **Land Use - Table 1** provides Staff’s analysis of the PSEGS’s consistency with applicable land-use related LORS.

**Land Use - Table 1  
PSEGS’s Consistency with Applicable Land Use LORS**

LORS		Consistency Determination	Basis for Consistency or Inconsistency	Proposed Condition of Certification
Source	Policy and Strategy Descriptions			
<b>Federal</b>				
Federal Land Policy and Management Act 1976	In 1976 Congress passed the Federal Land Policy Management Act - a law to direct the management of the public lands of the United States. In section 601, Congress required the preparation of a comprehensive long-range plan for the CDCA. The purpose of this plan was to establish guidance for the management of the public lands in the California Desert administered by the U.S. Bureau of Land Management.			
The CDCA Plan 1980 as amended				
Chapter 2 Multiple-Use Classes:  - Multiple-Use Class M (Moderate Use)	Multiple-Use Class M (Moderate Use) is based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, livestock grazing, recreation, energy, and utility development. Class M management is also designed to conserve desert resources and to mitigate damage to those resources which permitted uses may cause.  All types of electrical generation	The PSEGS would be consistent if the BLM approves two project-specific CDCA Plan amendments.	The PSEGS is to be constructed on federal land administered by the BLM.  Sites associated with power generation or transmission not identified in the CDCA Plan is considered through the CDCA Plan amendment process	Condition of Certification  LAND-1

LORS		Consistency Determination	Basis for Consistency or Inconsistency	Proposed Condition of Certification
Source	Policy and Strategy Descriptions			
	<p>plants may be allowed in accordance with state, federal, and local laws.</p> <p>New gas, electric, and water transmission facilities and cables for interstate communication may be allowed only within designated corridors.</p> <p>Existing facilities within designated corridors may be maintained and upgraded or improved in accordance with existing rights of way grants or by amendments to right of way grants. Existing facilities outside designated corridors may only be maintained but not upgraded or improved.</p>		<p>(USDO1980).</p> <p>All requests for amendments must be submitted to the District Manager of the California Desert District (USDO1980).</p> <p>The project owner has submitted an application to the BLM requesting a project-specific CDCA Plan amendment and right of way grant</p>	
<p>Chapter 3 Plan Elements</p> <p>- Energy Production And Utility Corridors Element</p>	<p>Sites associated with power generation or transmission not identified in the Plan will be considered through the CDCA Plan Amendment process.</p> <p>Utility needs which do not conform to an adopted corridor system will be processed by means of a Plan Amendment in conjunction with necessary permit hearings required by other agencies.</p> <p>The scope of the CDCA allows the designation of corridors which address the following types of utility facilities:</p> <ul style="list-style-type: none"> <li>• New electrical transmission towers and</li> </ul>	<p>The project would be consistent if the BLM approves a project-specific CDCA Plan amendment.</p>	<p>The route for the transmission line between the PSEGS and the SCE Red Bluff Substation has been identified and the substation will be operational by December 2013.</p> <p>Sites associated with power generation or transmission not identified in the CDCA Plan are considered through the CDCA Plan amendment process (USDO1980).</p>	<p>Condition of Certification</p> <p>LAND-1</p>

LORS		Consistency Determination	Basis for Consistency or Inconsistency	Proposed Condition of Certification
Source	Policy and Strategy Descriptions			
	<p>cables of 161 kV (kilovolt) or above; and</p> <ul style="list-style-type: none"> <li>All pipelines with diameters greater than 12 inches.</li> </ul> <p>The following criteria are used in determining decisions contained in this element. These criteria also will be used when evaluating future applications:</p> <p>(1) Minimize the number of separate rights of way by utilizing existing rights of way as a basis for planning corridors;</p> <p>(2) Encourage joint use of corridors for transmission lines, canals, pipelines, and cables;</p> <p>(3) Provide alternative corridors to be considered during processing of applications;</p> <p>(4) Avoid sensitive resources wherever possible;</p> <p>(5) Conform to local plans whenever possible;</p> <p>(6) Consider wilderness values and be consistent with final wilderness recommendations;</p> <p>(7) Complete the delivery-systems network;</p> <p>(8) Consider ongoing projects for which decisions have been made, for example, the Intermountain Power Project; and</p> <p>(9) Consider corridor networks which take into account power needs and alternative fuel resources.</p>		<p>All requests for amendment must be submitted to the District Manager of the California Desert District (USDOI1980).</p>	

(Ex. 2000, pp. 4.5-14 – 4.5-17.)

## **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** section of this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Throughout this Decision, we describe various benefits that will accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. The PSEGS site is designated “Developable” in the BLM’s Eastern Riverside County Solar Energy Zone. The PSEGS will reduce the original PSPP footprint to avoid environmental impacts. As a result, the PSEGS project’s footprint no longer extends into any private parcel, but instead is situated entirely on land administered by the BLM. The use of a fully-permitted site (as reconfigured) on the BLM land designated for solar development is a responsible approach to helping California achieve its Renewable Portfolio Standards and beyond.

## **PUBLIC COMMENT**

There following comments received from the public regarding the land use:

On October 28, 2013, the **County of Riverside** provided comments regarding the need to pay developer impact fees and fire-facility fees to cover the use of the County’s rights-of-way. The County also questioned the amount of revenue/compensation that would flow to it from solar projects.

An e-comment was received on November 7, 2013, from “**Veena**” (no last name) regarding the ability of existing land uses, particularly those related to agriculture, to continue after construction and operation of the PSEGS.

On November 25, 2013, **Paul Smith** of the Tourism Economics Commission submitted written comments regarding the impacts on the vistas from Joshua Tree National Park. The letter cited to a study conducted by the University of Idaho that found that 90 percent of the visitors came to Joshua Tree because of the views unspoiled by development, as well as 65 percent being attracted by the dark, starry-night skies that

would be interrupted by the lighted solar towers. This conflicts with the recreational land use in the area.

These concerns are all addressed above, as well as in the **VISUAL RESOURCES** and **WORKER SAFETY AND FIRE PROTECTION** sections of this Decision.

### **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. The PSEGS is located on public land (federal land) administered by the BLM.
2. The approximately 3,794 acre PSEGS site is within the federal CDCA Plan area.
3. The project area is in the “Multiple-Use Class M” land use category.
4. The Class M land use category allows electrical generation plants, but is subject to the approval of a CDCA Plan amendment by the BLM.
5. With implementation of Conditions of Certification **BIO-9** through **BIO-11**, the PSEGS would be compatible with the NECO.
6. The project area consists of relatively-undisturbed, unimproved desert dominated by sand and Sonoran creosote brush scrub, as well as desert dry wash woodland, unvegetated ephemeral dry wash areas, and desert dunes.
7. The PSEGS power-generating facility and related transmission facilities require the BLM’s approval of a ROW grant and two CDCA Plan amendments.
8. With the BLM’s approval of the ROW grant and plan amendments, the PSEGS and transmission line would be consistent with the CDCA Plan.
9. The land upon which the PSEGS will be built is not prime or agricultural land of statewide importance.
10. The PSEGS will not result in a significant impact to Williamson Act contracted land.
11. The PSEGS does not conflict with zoning for, or cause rezoning of, forest land, timberland or land zoned Timberland Production.
12. PSEGS does not involve other changes to the existing environment that would convert farmland or forest land.
13. The nearest community to the PSEGS (Desert Center) is 10 miles away.
14. PSEGS will not physically disrupt or divide an existing community.
15. The 3,794-acre PSEGS site is not within an approved U.S. Fish and Wildlife Service habitat conservation plan under section 10 of the Endangered Species Act, or within an approved California Department of Fish and Wildlife natural

community conservation plan under section 2800 of the Natural Communities Conservation Act.

16. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. With implementation of the mitigation measures specified in this Decision, and in the conditions of certification below, we conclude that construction and operation of the PSEGS project will not result in significant direct, indirect or cumulative land use impacts.
2. The record contains an adequate analysis of the land use LORS that are relevant to the PSEGS project and establishes that the project will comply with all relevant LORS.
3. The change in the project will be beneficial to the public, Petitioner, and Intervenor because the PSEGS site is designated “Developable” in the BLM’s Eastern Riverside County Solar Energy Zone. The PSEGS has reduced the original PSPP footprint so project’s footprint no longer extends into any private parcel. Instead, it is situated entirely on land administered by the BLM. The use of a fully permitted site (as reconfigured) on the BLM land designated for solar development is a responsible approach to helping California achieve its Renewable Portfolio Standards and beyond.
4. There has been a substantial change in circumstances since the original approval because at the time of the original licensing, the project was wholly-owned by Solar Millennium. PSH did not acquire the project site until after the Commission’s Final decision on PSPP.

## **CONDITIONS OF CERTIFICATION**

**LAND-1** Prior to the start of construction, the project owner shall provide to the Compliance Project Manager (CPM) documentation of the U.S. BLM Right-of-Way grant and the BLM-approved project-specific amendment to the CDCA permitting the construction/operation of the proposed Palen Solar Electric Generating System.

**VERIFICATION:** Prior to the start of construction, the project owner shall submit to the CPM a copy of the BLM approved Right-of-Way Grant and project specific amendment to the CDCA Plan permitting the Palen Solar Electric Generating System.

## **B. TRAFFIC AND TRANSPORTATION**

### **DESCRIPTION OF MODIFICATIONS**

The modified project Palen Solar Electric Generating System (PSEGS) would use BrightSource's solar power tower technology instead of the originally-approved parabolic trough solar collection system and associated heat transfer fluid. The modified project would consist of two solar fields designated as Unit 1 and Unit 2, each comprised of 85,000 heliostats (elevated mirrors guided by a tracking system mounted on a pylon) and a 760-foot-high tower. To produce electricity, the heliostats would focus the sun's rays on a solar receiver steam generator located atop each tower, creating steam to drive a turbine that would generate electricity. Each solar field would produce 250 MW of electricity for a combined nominal output of approximately 500 MW. (Ex. 2000, p. 4.10-4.)

The two solar fields would share common facilities, including a common area containing an administration building, warehouse, evaporation ponds, maintenance complex, a meter/valve station for incoming natural gas service to the site, an on-site switchyard, and a 10-mile single-circuit 230-kV generation tie-line to deliver power to the newly constructed Red Bluff Substation immediately south of Interstate 10 (I-10). Other on-site facilities would include access and maintenance roads (either dirt, gravel, or paved), perimeter fencing, tortoise fencing, and other ancillary security facilities. During project construction, there would be an approximately 203-acre lay-down area located in the southwestern portion of the site. This area would be used for lay down of materials, parking, staging of traffic to avoid congestion at the I-10/Corn Springs interchange, and possibly a temporary concrete batch plant. (Ex. 2000, p. 4.10-4.)

As with the original project, site access would be from Corn Springs Road at the I-10 interchange. Corn Springs Road currently runs north-south across I-10 and terminates just north of the I-10 overpass. From this dead-end, a new 1,350-foot-long access road running east to the project site entrance would be constructed. The new access road would have a paved width of 24 feet and a 12-foot-wide gravel shoulder for truck staging. (Ex. 2000, p. 4.10-4.)

If approved, the units would be constructed in phases with the first phase of construction including the generation tie-line and Unit 1, and the second phase including Unit 2. The first phase of construction likely would not begin until spring 2015 to allow for desert tortoises to be cleared from the site. Commercial operation would likely begin summer 2017. (Exs. 2000, p. 4.10-5; 1167, 1168.)

The following evidence on traffic and transportation was received into evidence on October 28, 2013: Exhibits 1003, 1010, 1040, 1041, 1042, 1044, 1057, 1059, 1063,

1069, 1073, 1074, 1076, 1116 through 1121, 2000, 2002, 2003, and 2008. (10/28/13 RT 204:16 – 206:12; 208:4 - 19.) The following evidence on traffic and transportation was received into evidence on July 29, 2014: Exhibits 1142, 1180, 1187, 1191, 2017, 2018, 2023 through 2028, 2033, 4001 through 4006, and 8031 through 8034. (7/29/14 RT 117:18 – 123:5.)

## **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP concluded that implementation of conditions of certification would attenuate the significant direct, indirect, or cumulative impacts to traffic and transportation, including impacts from glint and glare during operation of the collectors, to a level of “less than significant.” The decision further concluded that the PSPP would comply with all federal, state and local LORS pertaining to traffic and transportation (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, pp. 13-14.)

The final decision determined that the PSPP site would be located in eastern Riverside County, about 10 miles east of the unincorporated community of Desert Center, 3 miles east of the southeastern end of Joshua Tree National Park, and about 0.5 miles north of U.S. I-10. The PSPP site lies on approximately 40 acres of private property and 5,160 acres of federal land managed by the Bureau of Land Management (BLM). Site access would be from an extension of Corn Springs Road at the I-10 interchange. The Corn Springs Road extension would be about 1,350 feet long and would run east from just north of the I-10 Corn Springs Road entrance/exit ramps to the project site entrance. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p.1.)

The decision also stated that the local highways and roads in the project vicinity are U.S. I-10, Corn Springs Road, and Chuckwalla Valley Road. Further, there is no rail or bus service near the project, and bicycle and pedestrian facilities are “minimal to none.” There are no airports sufficiently close to the project (within 20,000 feet or less) to require FAA notification. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 2.)

The decision further held that the majority of the PSPP was to be located on public land (federal land) administered by the BLM and that, similar to the PSEGS project, the Applicant applied for the required Right-of-Way grant from the BLM. Site access would be from an extension of Corn Springs Road at the I-10 interchange. The Corn Springs Road extension would be about 1,350 feet long and would run east from just north of the I-10 Corn Springs Road entrance/exit ramps to the project site entrance. BLM continues to review the Applicant's request. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 1.)

During construction, the Final Decision found that PSPP would require that oversized equipment, such as the steam turbine generator and main transformers, be transported to the site via multi-axle trucks. The work would generate an average of approximately 20 to 30 daily one-way truck trips, with a peak of approximately 40 daily one-way truck trips. Impacts related to vehicle size limits and driver licensing, hazardous cargoes, and road damage repair were mitigated by Conditions of Certification **TRANS-1**, **TRANS-2**, and **TRANS-3**, respectively. Peak construction would cause a noticeable increase in traffic on I-10. However, with Condition of Certification **TRANS-4** that required the project owner to prepare a traffic control plan to reduce work trips through means such as staggered work shifts, off-peak work schedules, and an incentive program for carpooling, all study roadways and intersections would operate at a Level of Service (LOS) C or above during project construction. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 6.)

As to operations, the decision outlined that the PSPP would require a labor force of about 134 employees to staff the facility 24 hours a day, 7 days a week. This would create approximately 268 daily one-way trips, assuming that workers travel in their own individual vehicles. Because employees would arrive and depart at different times throughout the day, they would generate less than 100 daily peak hour trips, even if every employee commutes alone. The operations workforce would be likely to use the same routes to access the project as would the construction crews. Operation of the PSPP would also generate minor truck traffic during activities such as supply delivery and off-site waste shipments. Project operation is anticipated to generate up to six truck trips per day, which would not affect the LOS on relevant roadways and intersections. This level of trip generation by the PSPP did not result in any change to the existing LOS. Accordingly, no impacts to traffic were found that required mitigation. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 8.)

The PSPP found that major glint or glare issues for motorists would be from specular reflections from the mirrors in the mornings and evenings during the summer when the sun rises and sets to the north. During these times, there may be glare visible to motorists driving west (during the morning) or east (during the evening) from the south end of the trough collectors or when the collectors are moving off-axis or from the stow position. To mitigate these potential glare impacts, the Commission imposed Condition of Certification **TRANS-6**, requiring the movement of the collectors to or from stow position only after sunset or before sunrise. Condition of Certification **VIS-4**, in the **VISUAL RESOURCES** section of the decision, further required slatted fencing between the project and I-10. This fencing would help mitigate any glare caused by spillage from the south end of the collectors. Thus, impacts to motorists from glint and glare were

mitigated to a level of “less than significant.” (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, pp. 9-10.)

Both the construction and operation of the PSPP would involve the transport of hazardous materials to the site. Heat transfer fluid would be delivered during construction, and two weekly deliveries of liquefied petroleum gas (LPG) would be made during project operation. In addition to the governing federal and state regulations, Condition of Certification **TRANS-2** required that the project owner secure permits and/or licenses from the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans) for the transport of hazardous materials. In addition, Condition of Certification **HAZ-3** in the **HAZARDOUS MATERIALS MANAGEMENT** section of this Decision would require the Applicant to develop and implement a Safety Management Plan for the delivery of hazardous materials. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 10.)

Finally, the decision found that the PSPP provided adequate parking. During construction, a temporary on-site parking area of approximately 10 acres would be created and relocated on the project site. Once operations commenced, employees would be accommodated in a 47,500 square foot facility sufficient for the 135-employee workforce. As a result, there were no significant impacts related to parking. (PSPP Final Decision, CEC-800-2010-011, **TRAFFIC AND TRANSPORTATION**, p. 10.)

## **THE AMENDED PROJECT IMPACTS**

Significance criteria used in this document for evaluating environmental impacts are based on the CEQA Guidelines, the CEQA Environmental Checklist for Transportation/Traffic, performance standards or thresholds identified by Energy Commission Staff, and applicable LORS used by other governmental agencies. Specifically, our analysis focused on whether the PSEGS project would:

1. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections);
2. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;

3. Conflict with an applicable congestion management program, including, but not limited to, level of service (LOS) standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
4. Substantially increase hazards due to a design feature (e.g., sharp curves, dangerous intersections, or glint and glare) or incompatible uses (e.g., farm equipment);
5. Result in inadequate emergency access;
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities;
7. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
8. Produce a thermal plume in an area where flight paths are expected to occur below 1,000 feet from the ground; or
9. Have individual environmental effects that, when considered with other impacts from the same project or in conjunction with impacts from other closely related past, present, and reasonably foreseeable future projects, are considerable or compound or increase other environmental impacts. (Ex. 2000, pp. 4.10-2 – 4.10-3.)

## **LOCAL HIGHWAYS AND ROADS**

The following describes the roadways in the vicinity of the PSEGS site:

### **U.S. Interstate 10**

Interstate 10 is an east-west regional arterial that crosses much of the southern United States. It runs from the L.A. area east to Phoenix, Arizona, where it turns south and continues to Tucson, Arizona, ultimately continuing east to Jacksonville, Florida. In the project area, the speed limit is 70 miles per hour and the road is fully improved to freeway status with two lanes in each direction. There are no bicycle or pedestrian facilities located on I-10 near the project site; however, bicycles are allowed on I-10 from Dillon Road, Coachella (west of the PSEGS site) to Mesa Drive, Blythe (east of the PSEGS site). Caltrans allows bicycle use on state highways where no alternative route is available. (Ex. 2000, p. 4.10-5.)

## **Corn Springs Road**

Corn Springs Road is an exit off of I-10 accessed by a diamond-configured interchange. The interchange includes single-lane ramps with ramp junctures, where stop signs control traffic from I-10 before it enters Corn Springs Road. Corn Springs Road is a relatively short road that runs north toward the project site, as well as south, where it intersects with Chuckwalla Valley Road. Corn Springs Road has a curb and gutter, but no bicycle or pedestrian facilities. (Ex. 2000, p. 4.10-5.)

## **Chuckwalla Valley Road**

Chuckwalla Valley Road is a minor local access road running in an east-west direction just south of I-10 in the vicinity of the project site. It is a two-lane frontage road extending from the southern part of the Corn Springs Road interchange to the Ford Dry Lake Road interchange approximately 10 miles to the east. Stop signs on the Chuckwalla Valley Road approaches control the Corn Springs Road/Chuckwalla Valley Road intersection. Chuckwalla Valley Road has a curb and gutter, but no bicycle or pedestrian facilities. (Ex. 2000, pp. 4.10-5 – 4.10-6.)

## **PUBLIC TRANSPORTATION**

Public transportation in the project area consists of rail and bus service, bicycle and pedestrian facilities, and airports. Information about these forms of public transportation follows.

### **RAIL AND BUS SERVICE**

The nearest passenger rail service is an Amtrak station in Palm Springs to the west. With regard to freight rail, on January 13, 2010, the Surface Transportation Board ruled that the Arizona & California Railroad Company could abandon service in Riverside County. Therefore, no rail service exists in the area. (Ex. 2000, p. 4.10-6.)

The nearest national bus service stations are the Indio and Blythe Greyhound stations. Local bus service near the project site is limited to the Red Route of the Desert Roadrunner bus service for Blythe, which provides service to the Ironwood/Chuckwalla Valley State Prison, approximately 21 miles east of the project, and the Sunline Transit Agency, which provides bus service in the vicinity of Indio. (Ex. 2000, p. 4.10-6.)

### **BICYCLE AND PEDESTRIAN FACILITIES**

Bicycle and pedestrian activity in the vicinity of the PSEGS site is minimal to none. Development is extremely low-density and spread over a large area, which is not conducive to biking or walking. (Ex. 2000, p. 4.10-6.)

## **AVIATION ACTIVITIES**

The nearest airport is the Desert Center Airport located approximately six miles northwest of the PSEGS site. It is a private airport with a pattern altitude of 1,559 feet above mean sea level (AMSL). The airport has one basic runway, Runway 5/23. For the 12-month period ending in December 2006, the most recent year for which data is available, the airport hosted 150 annual aircraft operations with all operating aircraft classified as transient general aviation (AIRNAV 2013). (Ex. 2000, p. 4.10-6.)

The Chocolate Mountain Aerial Gunnery Range (CMAGR) is approximately 15 miles south of the site. The U.S. Navy and U.S. Marines use this approximately 459,000-acre area for military aircrew training in air combat maneuvering and tactics, airborne laser system operations, gunnery, live fire aerial gunnery practice, aerial bombing, rocketry, and strafing (attacking ground targets). The Department of the Navy (DoN) owns approximately half of the CMAGR, while the Bureau of Land Management (BLM) manages the other half. The military's right to use the BLM-managed land expires in 2014, so the DoN is requesting that Congress renew its use of the land and continue the military reservation for another 25 years (DoN 2012). (Ex. 2000, p. 4.10-6.)

The project site also lies within the vicinity of the Department of Defense (DoD) military training routes VR-296, VR-1265, VR-1268, and IR-218. (Ex. 2000, p. 4.10-6.)

## **CONSTRUCTION PERIOD TRAFFIC IMPACTS AND MITIGATION**

Level of Service (LOS) is a generally-accepted measure used by traffic engineers and planners to describe and quantify the traffic congestion level on a particular roadway or intersection in terms of speed, travel time, and delay. The *Highway Capacity Manual 2010*, published by the Transportation Research Board Committee on Highway Capacity and Quality of Service, includes six levels of service for roadways and intersections. These levels of service range from LOS A, the best and smoothest operating conditions, to LOS F, the worst, most congested operating conditions. We use LOS to quantify the traffic congestion experienced on local roadways before and during project construction. (Ex. 2000, p. 4.10-7.)

Workers for the project would commute from the surrounding areas. Workers from regional areas would find temporary housing in Blythe, Indio, or Ehrenberg. Workers with permanent residences in Palm Springs, the Los Angeles basin, and the Indio area would travel east on I-10 to the project site, while workers from Blythe and the Arizona communities of Quartzsite, Ehrenberg, and Cibola would follow I-10 west to the project site. Workers residing permanently in San Bernardino County could follow either I-10 west or I-10 east to the project site. (Ex. 2000, p. 4.10-7.)

Construction of the PSEGS would occur over 33 months, with peak construction expected to occur during month 22 (in the Year 2015). The average daily workforce would be approximately 998 workers with a peak daily workforce of approximately 2,311 workers. The construction workforce would be higher than that proposed for the approved PSPP, which had an average daily workforce of 566 workers and a peak daily workforce of 1,141 workers. (Ex. 2000, p. 4.10-7.)

PSEGS construction workers would not all arrive at or depart from the project site at the same time, as the project owner has proposed that construction workers would be spread out over two or three work shifts. Also, some of the construction workers would be working off site on the transmission and gas lines. The project owner estimates that the day shift, which would begin at 5:00 a.m., would consist of 790 average daily workers and 1,700 peak daily workers. The project also assumes that carpooling would result in a 7.5 percent reduction in construction vehicle trips. This reduction is based on the assumption that 15 percent of workers would carpool. This carpooling estimate is based on the remote location of the project site, the high cost of gas, and the assumption that some workers would stay nearby at the same hotels and would carpool to and from the site. With an average of two people per vehicle, there would be a 7.5 percent reduction in construction vehicle trips. (Ex. 2000, p. 4.10-7.)

We adopt a more conservative analysis that evaluates trips made by all 2,311 construction workers, not just day shift workers, during the peak construction period during the peak hour of traffic in the project area. This analysis assumes that no carpooling would occur. For a summary of peak construction traffic impacts to study roadways, see (**Traffic and Transportation – Table 1** below). This table compares peak hour traffic volume and LOS on all study roadways during the Year 2015 without the PSEGS, and the Year 2015 with the PSEGS (during peak construction). During peak construction and peak hours, I-10 west and east of the PSEGS would be expected to operate at LOS A, a free-flowing traffic condition. However, Corn Springs Road would be expected to operate at LOS F, an LOS classification indicating the most congested traffic conditions. This would be a significant traffic impact. Congested LOS F traffic conditions on Corn Springs Road could potentially cause a bottleneck at the I-10/Corn Springs Road interchange causing project traffic to spill over onto I-10, resulting in traffic stacking on I-10 near the project site. (Ex. 2000, p. 4.10-8.)

**Traffic and Transportation – Table 1**  
**Peak- Hour Volumes and LOS on Study Roadways During Peak Construction**

Roadway Segment	Existing (2013) Volume	LOS	Peak Construction Year (2015) Volume without PSEGS	LOS	Peak Construction Year (2015) Volume with PSEGS	LOS
I-10 West of the PSEGS	1,611	A	1,643	A	<b>2,799</b>	<b>A</b>
I-10 East of the PSEGS	1,600	A	1,632	A	<b>2,788</b>	<b>A</b>
Corn Springs Road	2	A	2	A	<b>2,311</b>	<b>F</b>
Notes: <ul style="list-style-type: none"> <li>• Volume is peak hour volume.</li> <li>• Caltrans Year 2013 traffic volumes were expanded to Year 2015 using the rate of growth (1%/year) seen between 2012 and 2013 (Palen 2013ee, Palen 2013uu, CEC 2013y).</li> </ul>						

( Ex. 2000, p. 4.10-8.)

We also evaluate peak construction peak hour traffic impacts at intersections near the project site. See **Traffic and Transportation – Table 2** below, which compares peak hour delay and LOS on all study intersections during the Year 2015 without the PSEGS and the Year 2015 with the PSEGS (during peak construction). As shown in the table, the I-10 Westbound Ramps/Corn Springs Road and I-10 Eastbound Ramps/Corn Springs Road intersections would operate at acceptable levels of LOS C or better during the evening peak hour, but would operate at congested, unacceptable levels of LOS F during the morning peak hour. The LOS is better during the evening peak hour because much of the traffic leaving the site would be able to enter I-10 as a free, uncontrolled movement (without a stop sign). The LOS F conditions that would be experienced at these intersections during the morning peak hour would constitute a significant traffic impact. (Ex. 2000, pp. 4.10-8 – 4.10-9.)

**Traffic and Transportation – Table 2  
Peak-Hour Delay and LOS on Study Intersections During Peak Construction**

Intersection	Existing (2013) Delay and LOS		Peak Construction Year (2015) without PSEGS: Delay and LOS		Peak Construction Year (2015) with PSEGS: Delay and LOS	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
I-10 Westbound Ramps/Corn Springs Road	5.8 seconds LOS A	7.7 seconds LOS A	5.8 seconds LOS A	7.7 seconds LOS A	>50 seconds LOS F	0.5 seconds LOS A
I-10 Eastbound Ramps/Corn Springs Road	6.3 seconds LOS A	2.9 seconds LOS A	6.3 seconds LOS A	2.9 seconds LOS A	>50 seconds LOS F	19.7 seconds LOS C
Notes:						
<ul style="list-style-type: none"> <li>• Volume is peak hour volume.</li> <li>• Caltrans Year 2013 traffic volumes were expanded to Year 2015 using the rate of growth (1%/year) seen between 2012 and 2013 (Palen 2013ee, Palen 2013uu, CEC 2013y).</li> </ul>						

(Ex. 2000, p. 4.10-8.)

To mitigate the PSEGS’s significant peak construction traffic impacts to Corn Springs Road and to the I-10 Westbound Ramps/Corn Springs Road and I-10 Eastbound Ramps/Corn Springs Road intersections during the morning peak hour, we impose Condition of Certification **TRANS-1**, which requires the project owner to prepare a traffic control plan to reduce traffic impacts through means such as staggered work shifts, off-peak work schedules, and/or restricting travel to and departures from the project site to 10 or fewer vehicles every three minutes. This condition is the same as that proposed for the original project, with some minor modifications specifically asking for a detailed plan for construction worker arrival and departure times, and methods to ensure worker compliance. With the imposition of this condition of certification, we find that the impacts caused by peak construction traffic on Corn Springs Road and to the I-10 Westbound Ramps/Corn Springs Road and I-10 Eastbound Ramps/Corn Springs Road intersections during the morning peak hour would be reduced to a less-than-significant level.

Although the traffic analysis above does not include truck trips, the inclusion of truck trips would not significantly alter the outcome of the traffic LOS impacts analysis. During

construction, the average number of daily truck trips would be 20 round trips (40 one-way trips). During peak construction, the number of daily truck trips would be higher at approximately 45 daily roundtrips (90 daily one-way trips). Truck trips for the PSEGS would be higher than those for the PSPP. The PSPP as approved would have generated an average of approximately 10-15 daily truck round trips (20-30 one-way trips) during construction, with 20 daily round trips (40 one-way trips) during peak construction. To ensure that slow-moving truck delivery traffic would not cause back-ups and resulting impacts to traffic, LOS Condition of Certification **TRANS-1** requires limiting truck deliveries to off-peak construction commute hours and/or staggering truck deliveries throughout the day. (Ex. 2000, pp. 4.10-9 – 4.10-10.) Therefore, we hold that these construction-related truck trips do not create a significant impact on roadway operations.

Oversized or overweight trucks with unlicensed drivers could be hazardous to the general public and/or damage roadways. We therefore impose Condition of Certification **TRANS-2** that requires that the project owner comply with limits on vehicle sizes and weights and driver licensing regulations. Because construction traffic and trucks could also damage roadways, Condition of Certification **TRANS-3** requires that prior to construction, the project owner repave and restore all roads to a condition that could accommodate construction traffic and immediately restore all roads damaged by construction activities. Construction and/or construction repairs could require encroachment into public rights-of-way. Condition of Certification **TRANS-4** requires that the project owner obtain necessary encroachment permits from Caltrans and any other relevant jurisdictions and comply with limitations for encroachment into public rights-of-way. (Ex. 2000, p. 4.10-10.) With the imposition of Conditions of Certification **TRANS-2** through **TRANS-4**, inclusive, the potential impacts of construction-related truck traffic is reduced to a level of “less than significant.”

## **OPERATION TRAFFIC IMPACTS AND MITIGATION**

Analysis of the PSPP project indicated that with 134 daily operations workers and approximately six truck trips per day, there would be no significant impacts to LOS at the studied road segments or intersections during project operations. As part of the original project, we found that LOS on all roadways and intersections would continue to operate at LOS A, the pre-project LOS, which is better than the minimum LOS C. (Ex. 2000, p. 4.10-10.)

The PSEGS proposes approximately six truck trips per day, the same as for the approved PSPP, but 100 daily operations workers (40 during the day and 60 during the evening), a smaller number than the 134 daily operations workers proposed as part of the PSPP. However, to be conservative, the operations traffic impact analysis assumes

134 daily operations workers, the number of daily operations workers from the approved PSPP. See **Traffic and Transportation – Table 3**, Peak Hour Volumes and LOS on Study Roadways During Project Operation, and **Traffic and Transportation – Table 4**, “Peak Hour Delay and LOS on Study Intersections During Project Operation.” These tables show that during project operation, all roadways and intersections would operate at LOS A. Therefore, the PSEGS would result in less-than-significant operations impacts to LOS. (Ex. 2000, p. 4.10-10.)

**Traffic and Transportation – Table 3**  
**Peak Hour Volumes and LOS on Study Roadways During Project Operation**

Roadway Segment or Intersection	Year 2016 Volume without PSEGS	Year 2016 Volume with PSEGS	LOS
I-10: West of the project site	1,659	1,726	A
I-10: East of the project site	1,648	1,715	A
Corn Springs Road	2	136	A
Notes:  Caltrans Year 2013 traffic volumes were expanded to Year 2016 using the same rate of expansion (1%/year) seen between 2012 and 2013 (Palen 2013ee, Palen 2013uu, CEC 2013y).			

(Ex. 2000, p. 4.10-10.)

**Traffic and Transportation – Table 4  
Peak Hour Delay and LOS on Study Intersections During Project Operation**

Study Intersection	Year 2016 without PSEGS		Year 2016 with PSEGS	
	AM Peak Delay/LOS	PM Peak Delay/LOS	AM Peak Delay/LOS	PM Peak Delay/LOS
I-10 Westbound Ramps/Corn Springs Road	5.8 seconds LOS A	7.7 seconds LOS A	4.6 seconds LOS A	1.2 seconds LOS A
I-10 Eastbound Ramps/Corn Springs Road	6.3 seconds LOS A	2.9 seconds LOS A	8.5 seconds LOS A	6.2 seconds LOS A
Notes:  Caltrans Year 2013 traffic volumes were expanded to Year 2016 using the same rate of expansion (1%/year) seen between 2012 and 2013 (Palen 2013ee, Palen 2013uu, CEC 2013y, Palen 2013ddd).				

(Ex. 2000, p. 4.10-11.)

### **Emergency Services Vehicle Access**

The PSEGS includes a proposed primary access from Corn Springs Road. The proposed primary access provides adequate site access for emergency vehicles traveling to the site from I-10 and exiting on Corn Springs Road. (Ex. 2000, p. 4.10-11.)

Due to site constraints increasing the difficulty of providing a secondary access road, PSEGS will require at least two emergency access gates, one each on the north fence line and the south fence line. These gates will not encroach on Caltrans' right-of-way. In the event of an emergency, if the main access road was blocked, all-terrain fire engines would be able to access the site through these gates. PSEGS must contribute to the Riverside County Fire Department's all-terrain fire engines purchased by the Genesis Solar Energy Project by paying the Genesis project owners the PSEGS' fair share of the cost of the purchase and maintenance of the fire engines. (See the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision for more details.) We find these alternative emergency vehicle accesses adequate from a traffic and transportation perspective. (Ex. 2000, p. 4.10-11.)

## **Water, Rail, Bus, and Air Traffic**

The PSEGS is not adjacent to a navigable body of water and would not alter water-related transportation. The project also would not alter rail or bus transportation. No rail tracks or bus services exist on or near the project site. (Ex. 2000, p. 4.10-11.)

### **Aviation Activities**

The project site, with its proposed 750-foot-high solar towers, lies within the vicinity of DoD military training routes VR-296, VR-1265, VR-1268, and IR-218. Michael A. Aimone, Executive Director of the DoD Siting Clearinghouse, submitted a letter to the Energy Commission stating that while DoD predicts that the project would impact these military training routes, DoD believes these impacts can be mitigated and is not opposed to construction of the project. If the PSEGS is constructed, military aircraft would fly around the PSEGS or at higher altitudes. (Ex. 2000, p. 4.10-12.)

The PSEGS's 750-foot-high solar towers would exceed a height of 200 feet above ground level (AGL). Therefore, under title 14, part 77, of the Code of Federal Regulations, the towers would require review by the Federal Aviation Administration (FAA). In March 2013, the project owner submitted to the FAA, for each solar tower, a Form 7460-1 "Notice of Proposed Construction or Alteration" as required. The FAA responded to the submittal on July 18, 2013, with a "Determination of No Hazard to Air Navigation." The FAA stated that the Determination of "No Hazard" included any temporary construction equipment such as cranes or derricks with heights of up to 760 feet, but that any temporary construction equipment with heights of greater than 760 feet would require separate notice to the FAA. To ensure compliance, we impose Condition of Certification **TRANS-5** to require that the project owner notify the FAA of any construction equipment exceeding 760 feet in height. (Ex. 2000, p. 4.10-11.)

In the FAA's Determination of No Hazard for the solar towers, the FAA required as a condition of the Determination that the towers be marked and lighted in accordance with FAA regulations. To ensure compliance, we impose Condition of Certification **TRANS-6**, which requires the project owner to install obstruction marking and lighting on the solar towers as specified above by the FAA. This would reduce the potential for wildlife (birds and bats in particular) to be attracted to the project site where they could be subject to collisions or other anthropogenic sources of injury or mortality. (Ex. 2000, p. 4.10-12.)

With implementation of Conditions of Certification **TRANS-5** and **TRANS-6**, we find that the project would comply with FAA regulations and the project structures would not create a significant impact to aviation.

## **Thermal Plumes**

The PSEGS's wet-surface air cooler, auxiliary boiler and nighttime boiler would produce thermal plumes, hot columns of gas discharged toward the sky. Thermal plume velocities would be greatest at the discharge points, with plume velocities decreasing with increasing altitude. Aircraft flying through parts of thermal plumes exceeding 4.3 meters/second (m/s) in vertical velocity could experience moderate to severe turbulence, which could compromise pilot control and aircraft stability. (Ex. 2000, p. 4.10-13.)

To determine whether the thermal plumes emitted from the PSEGS would exceed 4.3 m/s at altitudes where aircraft could fly, Energy Commission Air Quality Staff modeled plume velocities for the project's wet surface air cooler, auxiliary boiler, and nighttime boiler. The results indicate that in each case, thermal plume vertical velocity exceeded 4.3 m/s at altitudes of approximately 200 feet above ground level (AGL) or below. At altitudes higher than approximately 200 feet AGL, thermal plume velocity was below the critical 4.3 m/s threshold for endangering aircraft. Aircraft would generally be flying at altitudes much higher than 200 feet AGL; therefore, we find the thermal plumes would have less-than-significant impacts to aviation. (Ex. 2000, p. 4.10-13.)

## **Glint and Glare Impacts on Motorists and Pilots**

The amended PSEGS mirrored heliostats and solar receiver steam generator (SRSG) tower would generate glint and glare, which could cause impacts to both ground traffic and aviation if sufficient to compromise a driver's or pilot's ability to operate his/her vehicle or aircraft. PSEGS Unit 2 is especially close to I-10 at a distance of approximately 4,500 feet from the highway. A thorough assessment of the PSEGS potential glint and glare impacts is provided in the FSA **Appendix TT1 – Visual Safety Impact Assessment**. (Ex. 2000, p. 4.10-13.)

## **Retinal Damage**

Retinal damage is a permanent loss of visual function in the affected retinal region and can be caused by either photo thermal or photochemical mechanisms. Photothermal damage is the physical damage to the retina that can occur from high levels of irradiance which thermally overload and burn the retina. Photochemical damage is associated with both long-duration exposure times and lower wave length (higher-energy) light exposure. For photo thermal retinal damage, the highest level of exposure considered to be safe is called the Maximum Permissible Exposure (MPE) limit. The MPE is an international standard and is specified for both momentary and continuous exposures. Calculations of the retinal irradiance from both the PSEGS heliostats and SRSGs have demonstrated that exposures at or above the MPE limit are not possible

outside the solar plant's boundaries. Therefore, there is no risk of photo thermal retinal damage to motorists or pilots. However, on-site workers within plant boundaries could experience a level of exposure exceeding the MPE for a very limited and unique set of conditions and tower observation points. See the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision for conditions of certification that would mitigate this impact by requiring site workers to wear the appropriate personal protection equipment (PPE) in the form of protective sunglasses. (Ex. 2000, pp. 4.10-13 – 4.10-14.)

Photochemical retinal damage is both dose-dependent and cumulative in nature. Motorists and pilots would not be exposed to light from the PSEGS for long enough periods of time to experience photochemical retinal damage. Only on-site workers would be at risk of photochemical retinal damage due to their extensive exposure to the ambient (background) light of the site (being outdoors essentially all day) and to the additional illumination from the heliostat field and SRSGs. See the **WORKER SAFETY AND FIRE PROTECTION** section of this Decision for conditions of certification that would mitigate this impact by requiring site workers to wear the appropriate PPE in the form of protective sunglasses. (Ex. 2000, p. 4.10-14.)

### **Glint and Glare**

Glint and glare may cause a viewer to experience difficulty seeing. While glint is a temporary flash of brilliant light, glare is a more sustained bright light. Additionally, glare is generally divided into two class types: discomfort glare and disability glare. Discomfort glare results in an instinctive desire to look away from a bright light source or difficulty in seeing a task. Disability glare renders the task impossible to view, such as when driving westward at sunset. (Ex. 2000, p. 4.10-14.)

Heliostats are sources of both glint and glare: glint from direct solar reflections and sustained glare from reflections of either the sun or sky background. The SRSGs are sources of sustained glare. This glint and glare could potentially impact motorists on I-10 and pilots flying near the project site. The record indicates that definitive standards for the safety effects of glint and glare, from distraction to discomfort to disability, do not exist and there are no reliable metrics for determining the glint and glare thresholds for a significant impact to traffic and transportation. (Ex. 2000, p. 4.10-14.)

### **Glint and Glare Impacts to Motorists from Heliostats**

Motorists could potentially experience glint and glare impacts from the PSEGS heliostats. The heliostats would commonly produce sky reflections. These would not be a significant source of glint and/or glare that would be experienced by motorists. However, during both project construction and operation, direct solar reflections from

the heliostats (DSRH) would cause discomfort glare to motorists within 10 miles of the project site, and possibly at even further distances. This would be a significant impact. To mitigate this impact, we impose Condition of Certification **TRANS-7**, which would require the project owner to develop and implement a heliostat positioning and monitoring plan to minimize the frequency of DSRH events during the testing, calibration, and operational phases of the PSEGS. With implementation of Condition of Certification **TRANS-7**, we find that glint and glare impacts to motorists would be less than significant. (Ex. 2000, p. 4.10-14.)

### **Glint and Glare Impacts to Aviation from Heliostats**

Energy Commission Staff originally testified that pilots could experience glint and glare impacts from the PSEGS heliostats, but the glint and glare would not be significant. (Ex. 2000, p. 4.10-15.) Based on this evidence, the PMPD concluded that with implementation of **TRANS-7**, individual or sequential DSRH events might cause mild discomfort to pilots, but would not be expected to induce severe discomfort or disability glare that would compromise pilots' abilities to operate their aircraft. The PMPD found glint and glare impacts to pilots to be less than significant. (Ex. 2017, p. 47.)

After the record was reopened, Petitioner offered Exhibit 1180, wherein its expert testified regarding Condition of Certification **TRANS-7**. Petitioner acknowledged the possibility that glint and glare could result in pilot complaints, but Condition of Certification **TRANS-7** requires that the project owner prepare a Heliostat Positioning Plan similar to that of the ISEGS project (see Exhibit 1191), which identifies areas of glint and glare concerns and addresses how the heliostats will be positioned to minimize glint and glare that could pose impacts off site. One of the central tenets of the condition is that it specifies a complaint resolution process that includes investigation and corrective mitigation action. The analyses in both the Revised Staff Assessment and the PMPD acknowledge the potential that errant heliostats could result in complaints, including complaints by pilots. The condition requires investigation and resolution of those complaints. Petitioner concludes that **TRANS-7** would reduce the potential glint and glare impacts to pilots to less-than-significant levels. (Ex. 1180, pp. 3-4.)

Intervenor Basin and Range Watch offered several ground-level photographs showing glare emanating from the ISEGS power plant (see Exhibits 4001 - 4003 and Exhibit 4004), which show an aerial view of ISEGS reflecting glare. Exhibits 4005 and 4006 show aerial views of ISEGS casting reflected glare.

Intervenor Colorado River Indian Tribes (CRIT) offered expert testimony indicating that the PSEGS project would be located on a busy airway between Phoenix and Los Angeles, such that pilots "could be exposed to hazardous operations." (Exs. 8031, pp. 4-5; 8032.)

Staff investigated reports of glare events related to ISEGS when the Clark County Department of Aviation (CCDOA) in Nevada sent a letter dated March 10, 2014, to several parties, including the Energy Commission, requesting a number of actions be taken in response to glare incidents reported by pilots and air traffic controllers. (Ex. 1142, pp. 3-6.) In addition, the director of the National Aviation and Space Administration (NASA) Aviation Safety Reporting System (ASRS) provided Staff with two reports on March 14, 2014, about glare incidents that occurred in August 2013. (Ex. 1142, pp. 7-9; Ex. 8033.) Both reports noted that pilots flying near Ivanpah Solar Energy Generating Station (ISEGS), located near the California/Nevada border, south of the town of Primm, encountered bright and significant glare generated by the solar facility. One pilot reporting this significant glare was flying at an altitude between 6,000 and 12,000 feet mean sea level (MSL) while the other pilot was at 36,000 feet MSL. (Ex. 2017, pp. 47 – 48.)

Petitioner introduced the preliminary response to the CCDOA letter in which the ISEGS project owner explained that the ISEGS power plant was not operational at the time of the two reports. The preliminary response claims that the heliostats were not completely calibrated at the time of the complaints to ASRS, but that at the time of the (undated) preliminary response, the heliostats were properly oriented and the revised stow position decreased the potential for glint and glare above the facility. (Ex. 1142, p. 14.)

On April 9, 2014, the ASRS Director issued another report of glare generated by ISEGS in March 2014. A pilot and a member of the flight crew of a corporate turbojet on approach to the Las Vegas McCarran International Airport flying north-northeast at 13,000 feet MSL, approximately 13-15 miles west-northwest of ISEGS, reported that they “were temporarily blinded by bright lights (reflections) from the ground.” The report further stated: “These reflections, coming from the new solar power station, were so bright that any attempt to look outside the plane was met with pain and temporary blindness even when looking back inside. Any attempt to see and avoid was useless and trying to find the airport during this time was painful as well. Exposure lasted about 5 minutes. We notified ATC [Air Traffic Control] and were told that they get a lot of complaints.” (Ex. 2017, p. 48, Ex. 1142.)

Staff testified that glare reports have been so numerous that the Federal Aviation Administration (FAA) issued a “Letter to Airmen” warning of the ISEGS glare on April 22, 2014. (Ex. 2017, p. 48.)

Staff obtained an aeronautical study from the FAA for ISEGS on June 10, 2014. The study provided flight information showing that approximately 11,969 flights occurred from surface level to 50,000 feet MSL within a 15 nautical mile (NM) radius of the ISEGS site during May 2014. These flights occurred during the day and night, with

approximately 90 percent taking place during the day. The study also included approximate flight altitude, departure and arrival, airports, time of day, and type of aircraft for all flights. The study indicated:

- Flights most frequently occurred between 10,000 and 20,000 feet MSL, followed by flights between 20,000 and 30,000 feet MSL;
- Heaviest departure airport demand was for Las Vegas and Los Angeles;
- Heaviest arrival airport demand was for Las Vegas and Los Angeles;
- The majority of flights were commercial jets with 70 passenger seats or more; and
- Flights occurred most frequently in this airspace between 9:00 a.m. and 4:00 p.m., although they occurred throughout the day as well. (Ex. 2017, pp. 48 – 49.)

To determine the approximate number of aircraft flying near the PSEGS site that could potentially experience glare, Staff reviewed an aeronautical study for PSEGS from the FAA on June 6, 2014. The study showed that approximately 8,458 flights occurred from surface level to 50,000 feet MSL within a 15 NM radius of the PSEGS site during May 2014. Approximately 86 percent of these flights occurred during the day. The study also included approximate flight altitude, departure and arrival, airports, time of day, and type of aircraft for all flights. Key observations from the study are:

- Flights most frequently occurred between 30,000 and 40,000 MSL, followed by flights between 20,000 and 30,000 MSL;
- The most frequent departure area was Southern California, with many aircraft departing from airports such as Los Angeles International, San Diego, Ontario, Palm Springs, and John Wayne-Orange County;
- The most frequent arrival airport was Phoenix, followed by John Wayne-Orange County, and San Diego;
- The majority of flights were commercial jets with 70 passenger seats or more; and
- Flights occurred most frequently in this airspace between 8 a.m. and noon, although they occurred throughout the day as well. (Ex. 2017, p. 49.)

The FAA study shows that like the airspace near the ISEGS, the airspace near the PSEGS is heavily used. It indicates that a large number of aircraft pilots could be exposed to significant glare from the facility, which could potentially compromise pilots' ability to safely operate their aircraft. The FAA and Caltrans Aeronautics are concerned about ISEGS glare incidents and expect modifications needed for ISEGS would be incorporated into the PSEGS design to minimize glare and the potential hazard to

navigable airspace in the PSEGS area. (Ex. 2017, p. 49.) CRIT also raised these concerns. (Exs. 8031; 8034.)

Energy Commission and Caltrans Aeronautics Staff flew around ISEGS on May 8, 2014, in a single-engine Bonanza aircraft and took a variety of photographs and video at different elevations from 13,000 to 5,000 feet MSL. Staff testified to significant glare that was generated by the ISEGS throughout the approximately 20-minute flight around the project that began at 11:45 a.m. The brightest glare was generated by heliostats in the standby position. The Caltrans pilot said that he preferred not to look at the glare for more than a second because it would interfere with flying the aircraft in a safe manner. In a subsequent e-mail to Energy Commission Staff, he indicated that glare from ISEGS was the brightest, most extensive amount of glare he had seen in his aviation career, which began in 1986. He stated that while flying eastbound near the ISEGS site at 13,000 MSL, he had to shield his eyes from the glare with his hand while scanning for air traffic. (Ex. 2017, p. 50.)

After participating in the air flight over ISEGS, Staff's glint and glare consultant submitted a report that included the following observations:

1. Substantial intermittent and sustained levels of glare occur in airspace above the ISEGS;
2. The greatest glare levels are sustained (often for many seconds) and appear to be generated from DSRH events from heliostats in the standby position. The number of heliostats simultaneously producing DSRH events is not known, but it is substantial and varies with respect to the position of the aircraft and time of day. Multiple DSRH events from heliostats in the standby position are sufficient to result in disability glare, compromised visual performance, and judgments by pilots that the glare is unacceptable for flight safety;
3. The sustained glare from multiple heliostats reflecting the sky in close proximity to the sun, but not reflecting the sun itself, is acceptable;
4. There are frequent "rogue" individual DSRH events coming from seemingly random field locations. Although they are visually distracting, individual DSRH events do not produce unacceptable levels of glint and glare; and
5. The sustained glare from the solar receiver steam generators (SRSGs) atop the towers is acceptable.

Staff's observations of ISEGS's significant glare led to the conclusion that because the PSEGS and ISEGS use similar technology, the PSEGS also has the potential to cause

significant glare to pilots from multiple DSRH events, particularly from heliostats in the standby position. (Ex. 2017, p. 50.)

Staff offered a variety of possible approaches for mitigating glare from ISEGS, and possibly PSEGS, but acknowledged that its initial assessments were limited by an incomplete understanding of the engineering requirements for maintaining efficient plant power generation operations. Staff suggested various engineering modifications and concluded that implementation of one or more of the suggested engineering modifications would likely be required to mitigate PSEGS glint and glare impacts to a level less than significant. (Ex. 2017, pp. 51 – 52.)

At the July 29, 2014 evidentiary hearing, the parties engaged in a short workshop to discuss further modifications to Condition of Certification **TRANS-7**. (8/29/14 RT 101:15 – 105:4.) Staff's expert's original position was that the project's glint and glare may have significant impacts to aviation. (8/29/14/RT 38:15 – 41:3; 45:19 – 47:20; 77:16 – 78:9.) The parties modified the language of Condition of Certification **TRANS-7** during the workshop, and as a result, Staff's expert opined that glint and glare events from the PSEGS project would likely be reduced to less-than-significant levels. (8/29/14 RT 111:4 – 114:21.) While CRIT and BRW's briefs disagree with Staff's ultimate significance determination, there was no contradictory evidence on this point. (CRIT 8/15/14 Opening Brief, pp. 11-13; BRW 8/18/14 Opening Brief, p. 2.)

We find that Condition of Certification **TRANS-7**, which requires the project owner to implement a heliostat positioning plan that, *inter alia*, mitigates glint and glare impacts through methods such as limiting the number of mirrors in the standby position, changing the geometry of the standby range to disperse reflections, improving calibration and positioning algorithms of the heliostats, providing a "light dump" for receiving heliostat standby reflections, and ongoing pursuit of other methods that would effectively mitigate glare, will reduce glint and glare impacts to aviation to below significant levels.

### **Glare from the SRSGs**

The SRSGs would produce unavoidable glare. Evidence suggests that sustained glare from the SRSGs during nominal operating conditions (where luminance would be less than  $1 \times 10^6$  cd/m<sup>2</sup>) would not produce discomfort or disability glare that would interfere with motorists' or pilots' abilities to operate their vehicles and planes, respectively. However, at higher luminance levels, the SRSGs could produce discomfort or disability glare that would significantly impact drivers on I-10. To ensure that the SRSGs operate at acceptable luminance levels (less than  $1 \times 10^6$  cd/m<sup>2</sup>) that would not impact drivers, Condition of Certification **TRANS-8** would require a solar power tower receiver luminance and monitoring plan. Condition of Certification **TRANS-8** provides

procedures for identification and mitigation of visual distraction, discomfort glare, or disability glare effects with the potential of causing significant impacts to motorists. (Ex. 2000, p. 4.10-15.)

### **Motorist Accidents**

Staff analyzed the potential for project glint and glare to cause motor vehicle accidents on I-10 (see **Appendix TT2 – Risk of Impacts To Vehicle Operators Driving on Interstate-10 Due To Glint and Glare Associated With the Palen Solar Electric Generating System**). In short, Staff determined that under normal operating conditions, the risk of glint or glare causing vehicular accidents would be less than significant. However, if a heliostat, during construction and before implementation of heliostat control algorithms, or a malfunctioning heliostat during operations were to be oriented even for a few seconds facing I-10 such that drivers would experience a direct (or within 10 degrees) reflection from a heliostat, visual impairment (flash blindness or disability glare) could occur and result in a vehicular accident. (See Ex. 2000, **Appendix TT2**, for more information.) (Ex. 2000, p. 4.10-15.)

Condition of Certification **TRANS-7** requires implementation of a heliostat positioning and monitoring plan that would mitigate these potential impacts to less than significant. Condition of Certification **TRANS-7** requires that the project owner cover the mirrored surfaces of the heliostats during construction until they are properly seated, oriented, and under computer control. It also requires the project owner to implement early heliostat computer control algorithms during construction to ensure that heliostats would not reflect onto I-10 motorists or any other ground-based observers during construction or operation. With implementation of **TRANS-7**, the PSEGS's potential to cause motor vehicle accidents would be less than significant. (Ex. 2000, p. 4.10-16.)

### **Transportation of Hazardous Materials**

Both the construction and operation of the amended PSEGS would involve the transportation of hazardous materials to the site. The transport vehicles would be required to follow federal and state regulations governing proper containment vessels and vehicles, including appropriate identification of the nature of the contents. (Ex. 2000, p. 4.10-16.)

In addition to the governing federal and state regulations, Condition of Certification **TRANS-9** requires that the project owner secure permits and/or licenses from the CHP and Caltrans for the transportation of hazardous materials. (See the **HAZARDOUS MATERIALS MANAGEMENT** section of this decision for more information.) With implementation of Condition of Certification **TRANS-9**, we find the PSEGS would cause

less-than-significant impacts to roadways and the traveling public from transportation of hazardous materials. (Ex. 2000, p. 4.10-16.)

### **PARKING CAPACITY**

Construction period parking demands would be accommodated by a construction lay-down area of approximately 203 acres. This parking area would accommodate all construction workforce vehicles. (Ex. 2000, p. 4.10-16.)

During project operation, employees would park on site at the common facilities area and at each power block. The project would provide 38 spaces at the common facilities area, 19 spaces at the Unit 1 power block, and 19 spaces at the Unit 2 power block for a total of 76 parking spaces. These parking areas would provide sufficient parking for all operation employees on site simultaneously (40 workers during the day and 60 workers during the evening). (Ex. 2000, p. 4.10-16.)

Because the PSEGS supplies an adequate amount of on-site parking, we find the project would not result in any parking spill-over to sensitive areas and would not create any adverse impacts. (Ex. 2000, p. 4.10-16.)

### **Project-Related Future Actions – Transportation and Traffic**

The original PSPP analysis included a discussion of the SCE Red Bluff Substation as an associated reasonably foreseeable project. It also included an analysis of traffic generated by construction of the substation. Because construction of the SCE Red Bluff Substation is currently underway and anticipated to be completed before start of construction of the PSEGS, there is no need to analyze substation traffic impacts at this point. (Ex. 2000, pp. 4.10-16 – 4.10-17.)

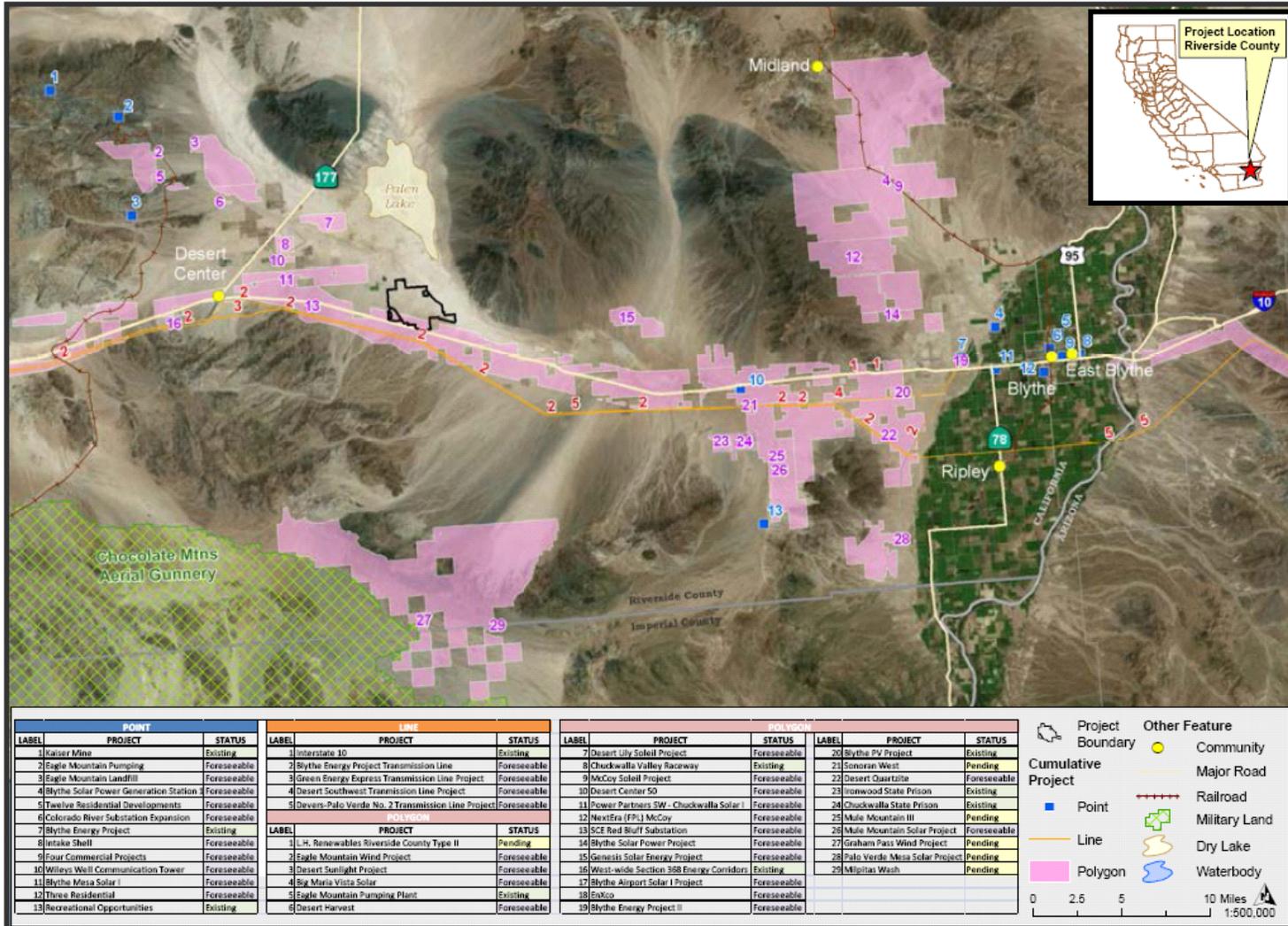
### **CUMULATIVE IMPACTS**

As identified in the **PRODUCT DESCRIPTION** section of this Decision, a number of projects within the region of the PSEGS have been approved, are under review, or are in operation (see **Traffic and Transportation - Figure 1 – Traffic and Transportation Cumulative Projects**). The potential exists for substantial future development throughout the entire Southern California Desert Region as well as on the I-10 corridor in eastern Riverside County. We analyze traffic and transportation impacts to the I-10 corridor of eastern Riverside County within a range starting approximately 20 miles west of the project site and ending approximately 40 miles east of the project site (near Blythe, California). This area encompasses many existing and proposed development projects, including many other energy projects that could generate traffic traveling on I-10 near the PSEGS site. See **Project Description - Tables 2, 3 and 4** for a list of

current, pending, and foreseeable development projects in this area. (Ex. 2000, p. 4.10-17.)

# Traffic and Transportation Figure 1 – Traffic and Transportation Cumulative Projects

Palen Solar Electric Generating System - Traffic and Transportation Cumulative Projects



(Ex. 2000, TRAFFIC AND TRANSPORTATION FIGURE 3)

Traffic LOS on I-10 could degrade with the volume of construction traffic generated by the PSEGS in combination with traffic generated by the identified additional projects shown in **Traffic and Transportation - Figure 1**. Condition of Certification **TRANS-1** will ensure that PSEGS's contribution to cumulative impacts is less than significant by requiring the PSEGS project owner to implement staggered work shifts and/or off-peak work schedules, and/or to restrict travel to and departures from the project site to 10 or fewer vehicles every three minutes. With implementation of **TRANS-1**, the PSEGS project's impacts to Corn Springs Road and the I-10 ramp intersections during the morning peak hour would be minimized, thus averting bottlenecks that could cause traffic back-ups on I-10 that could potentially contribute to cumulative impacts. With implementation of **TRANS-1**, we find that the PSEGS does not have a cumulatively considerable impact on I-10 as it is expected to continue to operate at LOS A in the project area during peak construction. (Ex. 2000, p. 4.10-17.)

We further find that the PSEGS operations traffic also will not contribute to cumulative traffic impacts, as operations traffic will be minimal. (Ex. 2000, p. 4.10-17.)

The PSEGS project would not combine with other nearby existing or proposed solar projects to cause significant cumulative glint and glare impacts to motorists. There are other nearby large-scale solar projects involving mirrors such as the operating Genesis Solar Energy Project (GSEP), which uses parabolic troughs. Similarly, the amended Blythe Solar Power Project (BSPP) which the Commission approved in January 2014 is under construction as a PV facility. Nevertheless, these projects are sufficiently far from the PSEGS so that motorists on I-10 would not experience glint and glare impacts from either of these projects simultaneously with the most severe glint and glare impacts from the PSEGS. The GSEP is approximately 15 miles east of the PSEGS site and the BSPP is approximately 30 miles east of the amended PSEGS site. Furthermore, since the BSPP was approved by the Commission for conversion to PV technology, it would emit very little glint and glare as PV panels are designed to absorb rather than reflect sunlight. We therefore find that the PSEGS would not have a cumulatively considerable impact on glint and glare experienced by motorists on I-10. (Ex. 2000, pp. 4.10-17 – 4.10-18.)

The PSEGS project also would not combine with other nearby existing or proposed projects to cause significant cumulative glint and glare impacts to pilots. Many nearby energy projects use solar photovoltaic technology that is designed to absorb solar energy rather than reflect it, which therefore does not generate glint or glare impacts to pilots. Mirrored projects could potentially produce glint and glare experienced by pilots. The GSEP is approximately 15 miles east of the PSEGS site, making it unlikely that pilots would experience glint and glare from it and the PSEGS at the same time. We

therefore conclude that the PSEGS cumulative impacts to aviation would be less than significant. (Ex. 2000, p. 4.10-18.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant laws, ordinances, regulations, and standards (LORS) applicable to traffic and transportation are contained in **Appendix A** of this Decision. Construction and operation of the PSEGS project would comply with all applicable LORS regarding long-term and short-term project impacts in the area of traffic and transportation. (Ex. 2000, p. 4.10-18.)

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Applicant, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information which was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

### **BENEFITS**

We find that the PSEGS would not yield any noteworthy public benefits related to traffic and transportation.

### **PUBLIC COMMENT**

The following comments received from the public regarding traffic and transportation:

In its October 29, 2013 letter, the **County of Riverside** requested that Condition of Certification **TRANS-3** be amended to require consultation with the County on which roads should be tested, not limiting the testing to Corn Springs Road. Further Condition of Certification **TRANS-3** should require provision of financial security to the County for ensuring that all roads damaged by the project are restored and that all monthly compliance reports be forwarded to the County for review and comment. As it relates to Condition of Certification **TRANS-7**, it should be amended to provide contract information in the event that the heliostats interfere with the County's Public Safety Communication System.

**Bob Sullivan** of Argonne National Laboratory commented that different people have different light sensitivities and will perceive glare impacts differently. He also commented that glare in the field is often brighter than can be captured by photography or videography. His final comment indicated that glare may cause distraction, but he could not say that it would cause health and safety impacts. (8/29/14 RT 105:20 - 109:6.)

Photographer **Jamey Stillings** commented that between October 2010 and February 2014, he undertook a documentary project about ISEGS. During this time he flew 18 times over ISEGS and took more than 16,000 photographs during all phases of the project from initial construction through commissioning and full operations. The helicopter flights originated from the North Las Vegas Airport. The altitude ranged from 500 to 6000 feet above the site, flying at dawn, sunrise, midday, late afternoon, and dusk. Never during any of these flights did any of the four pilots he used express concern or disallow a request because of reflections, glint, or glare from the ISEGS heliostats or towers.

These comments and concerns are all addressed above in the **TRAFFIC AND TRANSPORTATION** section of this Decision.

## **FINDINGS OF FACT**

Based on the evidence, we make the following findings:

1. Except as discussed below, all roads and intersections in the project vicinity operate at acceptable levels of service and would continue to do so after the addition of traffic associated with the construction and operations of the PSEGS.
2. Corn Springs Road would be expected to operate at LOS F, an LOS classification indicating the most congested traffic conditions. This would be a significant traffic impact.
3. The I-10 Westbound ramps/Corn Springs Road and I-10 Eastbound ramps/Corn Springs Road intersections would operate at acceptable levels of LOS C or better during the evening peak hour, but would operate at congested, unacceptable levels of LOS F during the morning peak hour. The morning peak-hour congestion would be a significant traffic impact.
4. Condition of Certification **TRANS-1**, which requires the project owner to prepare a traffic control plan to reduce traffic impacts through means such as staggered work shifts, off-peak work schedules, and/or restricting travel to and departures from the project site to 10 or fewer vehicles every three minutes, would reduce the impacts caused by peak construction traffic on Corn Springs Road and to the

I-10 Westbound ramps/Corn Springs Road and I-10 Eastbound ramps/Corn Springs Road intersections during the morning peak hour to a level of less than significant.

5. Condition of Certification **TRANS-2** requires that the project owner comply with limits on vehicle sizes and weights and driver licensing regulations so that potential impacts from oversized or overweight trucks with unlicensed drivers creating hazards to the general public and/or damaging roadways would be reduced to a level of less than significant.
6. Condition of Certification **TRANS-3** requires that prior to construction the project owner must repave and restore all roads to a condition that could accommodate construction traffic and immediately restore all roads damaged by construction activities, thus mitigating those impacts.
7. Condition of Certification **TRANS-4** requires that the project owner obtain necessary encroachment permits from Caltrans and any other relevant jurisdictions and comply with limitations for encroachment into public rights-of-way, thus mitigating impacts of construction and/or construction repairs that would encroach into public rights-of way.
8. Condition of Certification **TRANS-5** that requires the project owner to notify the FAA of any construction equipment exceeding 760 feet in height would mitigate any impacts to air traffic.
9. Condition of Certification **TRANS-6**, requiring the project owner to install obstruction marking and lighting on the solar towers, would reduce the potential for wildlife (birds and bats in particular) to be attracted to the project site where they could be subject to collisions or other anthropogenic sources of injury or mortality.
10. Condition of Certification **TRANS-7** requires a Heliostat Positioning and Monitoring Plan that would minimize the frequency of direct solar reflections from the heliostats during the testing, calibration, and operational phases of the PSEGS, resulting in less-than-significant impacts to motorists and pilots.
11. Compliance with Condition of Certification **TRANS-7** will reduce glint and glare impacts to aviation to below significant levels.
12. Condition of Certification **TRANS-8** requires a solar power tower receiver luminance and monitoring plan to provide procedures for identification and mitigation of visual distraction, discomfort glare, or disability glare effects with the

potential of causing significant impacts to motorists, resulting in less-than-significant impacts to the motoring public.

13. Condition of Certification **TRANS-9** requires that the project owner secure permits and/or licenses from the CHP and Caltrans for the transportation of hazardous materials, thus the PSEGS would cause less-than-significant impacts to roadways and the traveling public from transportation of hazardous materials.
14. Adequate parking for workers and supply lay-down space would be provided on site.
15. PSEGS would provide adequate emergency vehicle access roads.
16. Because of the PSEGS's great distance from the nearest rail and bus service, the project would have no impact on these forms of transportation.
17. Projects that have been constructed, are undergoing construction, or are otherwise reasonably foreseeable, have been considered in the cumulative impact analyses of this record.
18. As we found in ALTERNATIVES, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. Implementation of the conditions of certification listed below ensures that the PSEGS will not result in any significant direct, indirect, or cumulative adverse impacts to traffic and transportation.
2. With implementation of the conditions of certification below, the PSEGS project will comply with all applicable LORS related to traffic and transportation as identified in the evidentiary record and in the pertinent portion of **Appendix A** of this Decision.
3. The change in the project will be beneficial to the public, Petitioner, and Intervenor because the PSEGS site is designated "Developable" in BLM's Eastern Riverside County Solar Energy Zone. The power tower technology eliminates the use of millions of gallons of flammable Therminol, the heat transfer fluid utilized by the PSPP's parabolic trough technology. Furthermore, the PSEGS project will use less hazardous materials than the PSPP project and the solar tower technology voids the use of two very large propane storage tanks, thus eliminating risks to the public posed by the potential for fire and explosion.

4. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process, because at the time of the original licensing, the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision on the PSPP.

## CONDITIONS OF CERTIFICATION

**TRANS-1** Prior to the start of construction of the PSEGS, the project owner shall prepare and implement a Traffic Control Plan (TCP) for the PSEGS construction and operations traffic. The TCP shall address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes. The project owner shall consult with the County of Riverside and the Caltrans District 8 office in the preparation and implementation of the TCP. The project owner shall submit the proposed TCP to the County of Riverside and the Caltrans District 8 office in sufficient time for review and comment, and to the Energy Commission Compliance Project Manager (CPM) for review and approval prior to the proposed start of construction and implementation of the plan. The project owner shall provide a copy of any written comments from the County of Riverside and the Caltrans District 8 office and any changes to the TCP to the CPM prior to the proposed start of construction.

The TCP shall include:

- A work schedule designed to ensure that stacking does not occur at intersections necessary to enter and exit the project site. The project owner shall consider using one or more of the following measures designed to prevent stacking: staggered work shifts; off-peak work schedules; and/or restricting travel to and departures from each project site to 10 or fewer vehicles every 3 minutes. The submitted work schedule shall include a detailed plan for worker arrival and departure, including number of workers that are planned to arrive and depart at each time, and methods for ensuring worker compliance;
- A plan for monthly monitoring of traffic volume and/or delay at study roadways and intersections during periods of higher construction employment (months 19 through 25, including month 22, the peak construction month);
- Provisions for an incentive program, such as employer-sponsored commuter checks to encourage construction workers to carpool and/or use van or bus service;
- Limitation of truck deliveries at the project site to only off-peak construction commute hours and/or staggering of truck deliveries throughout the day;

- A heavy-haul plan addressing the transport and delivery of heavy and oversized loads requiring permits from Caltrans or other state or federal agencies;
- Timing of heavy equipment and building material delivery to the sites;
- Parking for workforce and construction vehicles;
- Emergency vehicle access to the project site;
- Provisions for redirection of construction traffic with a flag person as necessary to ensure traffic safety and minimize interruptions to non-construction-related traffic flow;
- Placement of signage, lighting, and traffic control devices at the project construction site and lay-down areas;
- Placement of signage along northbound Corn Springs Road and at the entrance of each of the I-10 westbound and eastbound off-ramps at Corn Springs Road notifying drivers of construction traffic throughout the duration of the construction period;
- Placement of signage to redirect traffic from Corn Springs Road during construction activities related to roadway realignments and pipeline installation in and across the Corn Springs Road right-of-way;
- Temporary closing of travel lanes, if necessary. When/if lane closures are required on the State Highway System during construction, refer to section 517 of Caltrans's Encroachment Permits Manual for the proper procedures to manage traffic during construction. The manual can be accessed online at:  
  
<http://www.dot.ca.gov/hq/traffops/developserv/permits/>; and
- Access to adjacent residential and commercial property during the construction of all linears.

**VERIFICATION:** At least 60 calendar days prior to the start of construction, including any grading or site remediation on the power plant site or its associated easements, the project owner shall submit the proposed TCP to the County of Riverside and the Caltrans District 8 office for review and comment and to the CPM for review and approval. The project owner shall also provide the CPM with a copy of the transmittal letter to the County of Riverside and the Caltrans District 8 office requesting review and comment.

At least 30 calendar days prior to the start of construction, the project owner shall provide copies of any comment letters received from either the County of Riverside and the Caltrans District 8 office, along with any changes to the proposed Traffic Control Plan, to the CPM for review and approval.

In the MCRs during months 19 through 25, submit the monitoring results for the study intersections.

**TRANS-2** The project owner shall comply with limitations imposed by Caltrans District 8 and other relevant jurisdictions, including the County of Riverside, on vehicle sizes and weights and driver licensing. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for roadway use.

**VERIFICATION:** The Monthly Compliance Reports (MCRs): the project owner shall report permits received during that reporting period. In addition, the project owner shall retain copies of permits and supporting documentation on site for CPM inspection if requested.

**TRANS-3** The project owner shall coordinate with Riverside County to conduct pavement testing for that portion of Corn Springs Road that could be utilized by PSEGS construction activities. Based on results of the pavement testing and prior to the first heavy haul delivery, the project owner shall make any necessary improvements to ensure that portion of Corn Springs Road that will be utilized for heavy haul construction activities will provide sufficient load-bearing capacity for heavy haul construction activities. Improvements must meet the minimum Riverside County or Caltrans standard (whichever is applicable) for a roadway that accommodates heavy trucks. Following construction, the project owner shall ensure that any roads damaged due to project-related construction activities are restored to original or near-original condition, as directed by the CPM and in coordination with Caltrans and/or Riverside County. Repair and restoration of access roads may be required at any time during the construction phase of the project to assure public safety. Repairs required during construction shall be made as soon as practical.

**VERIFICATION:** Prior to heavy haul activities, the project owner shall provide a copy of the pavement test to the CPM and Riverside County for review. At least 60 days prior to start of construction, the project owner shall establish a schedule for approval and completion of any roadway improvements.

At least 30 days prior to the start of site mobilization, the project owner shall consult with the County of Riverside and Caltrans District 8 and notify them of the proposed schedule for project construction. The purpose of this notification is to request that the County of Riverside and Caltrans consider postponement of public right-of-way repair or improvement activities in areas affected by project construction until construction is completed, and to coordinate with the project owner regarding any concurrent construction-related activities that are planned or in progress and cannot be postponed.

During construction, the project owner shall report in the MCRs any project-related damage requiring restoration and the status of that restoration. The MCRs shall be forwarded to Riverside County for review and comment on these activities. Within 60 calendar days after completion of construction, the project owner shall meet with the CPM, the County of Riverside, and Caltrans District 8 to identify sections of public rights-of-way to be repaired. At that time, the project owner shall establish a schedule to complete the repairs and to receive approval for the action(s). Following completion of any public right-of-way repairs, the project owner shall provide to the CPM letters signed by the County of Riverside and Caltrans District 8 stating their satisfaction with the repairs.

**TRANS-4** The project owner or contractor shall comply with Caltrans' and other relevant jurisdictions' limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and any other relevant jurisdictions. Design and construction for the project access road connection to the Corn Springs Road Interchange shall follow the guidelines in Caltrans Highway Design Manual section 504.8 – Access Control:

<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>

**VERIFICATION:** In the MCRs, the project owner shall report permits received during that reporting period. In addition, for at least 6 months after the start of commercial operation, the project owner shall retain copies of permits and supporting documentation on site for CPM inspection if requested.

**TRANS-5 Federal Aviation Administration Notification of Construction Equipment**

The project owner shall file a Form 7460-1 with the Federal Aviation Administration (FAA) regarding the use of any construction equipment exceeding 760 feet in height.

**VERIFICATION:** At least 90 days prior to ground disturbance, the project owner shall submit a copy of the FAA Determination of No Hazard to Navigable Airspace regarding the construction equipment to the CPM.

#### **TRANS-6 Obstruction Marking and Lighting**

The project owner shall install obstruction marking and lighting on the solar power tower. Marking and lighting for the towers shall be consistent with requirements provided in the FAA's "Determination of No Hazard" for the towers, and as expressed in the following documents:

- FAA Advisory Circular 70/7460-1K, Change 2, Obstruction Marking and Lighting, a med-dual system - Chapters 4, 8 (M-Dual), &12;
- FAA Safety Alert for Operators (SAFO) 09007. Evening lighting shall use the longest permissible interval between flashes and the shortest flash duration permissible. (See the **BIOLOGICAL RESOURCES** section for more information.) Temporary lighting must be installed once the tower reaches 200 feet in height during construction. Permanent lighting consistent with all requirements shall be installed and activated within five days of completion of construction and prior to the start of plant operation. Within five days after the tower reaches its greatest height, the FAA Form 7460-2 "Notice of Actual Construction or Alteration" shall be submitted to the FAA. Lighting shall be operational 24 hours a day, 7 days a week for the life of the project operation. Upgrades to the required lighting configurations, types, location, or duration shall be implemented consistent with any changes to FAA obstruction marking and lighting requirements. The FAA has proposed publishing guidance on the use of Audio Visual Warning Systems (AVWS) for obstruction lighting. The project owner has the future option to change the tower obstruction lighting system to an Audio Visual Warning System. An AVWS was recommended by the National Park Service in a comment on the FAA Notice of Construction or Alteration for the PSEGS to preserve the natural darkness in this portion of the Mojave Desert. If it is feasible and the project owner wishes to implement an AVWS in the future, the project owner shall consult with the FAA and the CPM as necessary.

**VERIFICATION:** At least 60 days prior to the start of construction, the project owner shall submit to the CPM for approval final design plans for the solar power tower that depict the required air traffic obstruction marking and lighting, including the temporary lighting. Within 1 day of the tower height reaching 200 feet in height, the project owner shall install temporary lighting consistent with FAA requirements and shall inform the

CPM in writing (including a photo of the lighting) within 10 days of installation. Within 5 days of completion of solar power tower construction and prior to the start of plant operation, the project owner shall install and activate permanent obstruction marking and lighting consistent with FAA requirements and shall inform the CPM in writing within 10 days of installation and activation. The project owner shall also provide to the CPM a copy of Form 7460-2 provided to the FAA. The CPM (or designated inspector) shall conduct an inspection after activation to ensure the lighting is operable and has been installed with federal installation and manufacturing standards as established by the FAA under FAA Advisory Circulars.

#### **TRANS-7 HelioStat Positioning and Monitoring Plan**

To reduce glint and glare from the project, the project owner shall prepare a HelioStat Positioning and Monitoring Plan (HPMP) (the HPMP shall be implemented during installation of the heliostats and during project operation) that includes the following information:

1. Identify the heliostat movements and positions (including during normal operations, daytime mirror-washing, removal of solar flux due to high winds, and all non-normal known operational scenarios and possible malfunctions) that could result in potential exposure of observers at various locations, including pilots, motorists, pedestrians, hikers in nearby wilderness areas, and the Riverside County PSEC Project Tower, to direct solar reflections from the heliostats (DSRH);
2. Describe within the HPMP how programmed heliostat operation would address potential human health and safety hazards from DSRH (DSRH Events) at locations of observers, and how it would maximally limit or avoid potential exposures. This shall include heliostat positioning and transition algorithm exclusion zones that maximally avoid DSRH Events on the ground and in the air;
3. Describe within the HPMP how disabling glare to pilots from heliostats in the standby position would be reduced through methods such as limiting the number of mirrors in the standby position, changing the geometry of the standby ring to disperse reflections, improving calibration and positioning algorithms of the heliostats, providing a “light dump” or receiver for heliostat standby reflections, or use of any other method that would effectively mitigate glare;
4. Describe how the mirrored surfaces of the heliostats would either be covered or oriented to minimize DSRH Events on I-10 and at the Riverside

County PSEC Project Tower during construction until calibration activities whereby the heliostats are properly seated, oriented, and under computer control to avoid exclusion zones;

5. Implement a set of baseline heliostat positioning and control algorithms to minimize DSRH Events as soon as realistically possible after heliostat installation. The baseline control algorithms shall initially minimize ground-based DSRH Events during site set-up, testing and calibration prior to power generation operations. If this does not work to minimize ground-based DSRH Events on I-10, the project owner shall modify the perimeter fencing along I-10 to minimize DSRH Events experienced by motorists on I-10;

6. Prepare a monitoring plan to quantify the frequency and locations of DSRH Events and validate that the DSRH Events are minimized by HPMP implementation. The monitoring plan shall ensure that the project owner continues to try different methods of reducing glare impacts so that there is not a DSRH event that is a Health and Safety Issue.

To monitor DSRH Events on the ground, a staring camera system along a known line of sight to ground-based observation points (e.g., I-10) shall be used. DSRH Events experienced by pilots could be monitored by flying over and photographing or videotaping the PSEGS and by seeking out pilot reports of glare from sources such as the NASA Aviation Safety Reporting System (ASRS) and nearby airports and aviation agencies.

The monitoring plan shall be made available to interested parties, including the DoD, Caltrans, CHP, FAA, Riverside County Economic Development Agency Department of Aviation, the Riverside County ALUC, and the Riverside County Transportation and Land Management Agency. The monitoring plan shall be updated on an annual basis during project construction and for the first five years of project operation. The monitoring plan shall be updated at two-year intervals thereafter for the life of the project, unless the project owner is released from this requirement as discussed in section 8 of this condition.

7. Obtain field measurements in candela per meters squared and watts per meter squared to validate that the HPMP avoids the potential for human health and safety hazards consistent with the methodologies detailed in the 2010 Sandia Lab document presented by Clifford Ho, et al., including those studies and materials related to ocular damage referenced within;

8. Provide requirements and procedures to document, investigate and resolve legitimate complaints regarding glint and glare events. This includes establishing a toll-free number for the public to report complaints related to glint and glare and posting this number in the same location as that required in Condition of Certification **COM-11**.

If no legitimate complaints are received and/or if a legitimate complaint is received and the project owner has resolved the source of the complaint(s) to the satisfaction of the CPM within the first five years of project operation, the project owner can request that the CPM release the project owner from the obligations under section 6 of this condition after the fifth year of project operations;

9. The HPMP shall include a communication protocol for Riverside County with specific contact information whereby Riverside County can speak to a representative at the PSEGS site 24 hours a day/7 days a week to respond to requests from the Riverside County PSEC Project to investigate potential interference with operation of the PSEC microwave tower.

**VERIFICATION:** At least 60 days prior to the start of construction, the project owner shall prepare and submit to the CPM for review and approval a plan for baseline heliostat positioning and control algorithms and other methods to minimize DSRH events after heliostat installation and during site set-up, testing, and calibration. At least 90 days prior to the start of operation, the project owner shall submit the remainder of the HPMP describing how the above measures will be implemented to reduce glint and glare during project operation, and how monitoring will occur.

If the project owner receives a complaint regarding glint or glare, the owner shall conduct an investigation to determine whether the complaint is legitimate and if the project is the source of such glint or glare. If it is determined that the complaint is legitimate and the project is the source of such glint or glare, the project owner shall take all feasible measures to eliminate or reduce the glint or glare. Such measures may include localized screening.

The project owner shall notify the CPM within 3 days of receiving a glint or glare complaint. The complaint shall be resolved within 10 days or at another time agreed to by the CPM, at which time the project owner shall submit to the CPM a report in which the complaint(s) as well as the actions taken to resolve the complaint(s) are documented. The report shall include: (a) a complaint summary, including the name and address of the complainant; (b) a discussion of the steps taken to investigate the complaint; (c) the reasons supporting a determination of whether or not the complaint is

legitimate; and (d) the steps taken to address the complaint and the final results of these efforts. This information shall be included in the Annual Compliance Reports.

If no legitimate complaints are received and/or if a legitimate complaint is received and the project owner has resolved the source of the complaint(s) to the satisfaction of the CPM within the first 5 years of project operation, the project owner can request that the CPM release the project owner from the obligations under section 6 of this condition after the 5th year of project operations.

**TRANS-8 Power Tower Luminance Monitoring Plan.**

The project owner shall prepare a Power Tower Luminance Monitoring Plan for providing procedures for conducting periodic monitoring of power tower luminance and for documenting, investigating, and resolving complaints regarding visual distraction or discomfort glare effects from the power tower experienced by pilots, motorists, and pedestrians.

The Power Tower Luminance Monitoring Plan shall include provisions for the following:

1. Measurement of luminance using an appropriate photometer or similar device and reporting of data in photometric units. The measurements are intended to:
  - a) Develop a baseline of tower luminance measurements to verify that the luminance values are not in excess of  $10^6$  cd/m<sup>2</sup> and to support anticipation and investigation of any future visual distraction or discomfort glare events; and
  - b) Provide quantitative measures of luminance that can be associated with any observed and reported visual distraction or discomfort glare events/effects from the power tower receiver;
2. Coordination of luminance evaluations with the FAA, DoD, Caltrans, CHP, Riverside County Economic Development Agency Department of Aviation, Riverside County Transportation and Land Management Agency, and the Riverside County Airport Land Use Commission (ALUC) in relation to the Desert Center and Blythe Airports and I-10. Within 30 days after completing luminance measurements required under this plan, the project owner shall submit a summary report to these agencies for review and comment, and to the CPM for review and approval;
3. Measurement of luminance at locations where any visual distraction or discomfort glare effects have been reported or at a representative site

location where accurate measurements of luminance can be made that would be representative of conditions prompting the complaint;

4. Identification and implementation of appropriate mitigation measures if reported visual distraction or discomfort glare events are determined to be legitimate and/ or if power tower luminance is determined to be causing a safety concern. The project owner shall consider and propose any reasonable mitigation measures that are technically and financially feasible. The mitigation measures may include: surface treatment; material or structural changes to increase absorption and reduce reflectivity of the power tower receiver; reduction of the number of heliostats incident on the tower; road signage; screening; or other reasonable measures to either reduce luminance or mitigate the safety concern; and

5. Post-mitigation verification. Within 30 days following the implementation of mitigation measures designed to reduce reflectivity of the power tower or mitigate the safety concern, the project owner shall repeat the luminance measurements to demonstrate the effectiveness of mitigation measures and prepare a supplemental survey report for review and comment by the FAA, Caltrans, CHP, Riverside County Economic Development Agency Department of Aviation, and the Riverside County ALUC for review and comment, and to the CPM for review and approval.

**VERIFICATION:** At least 90 days prior to commercial operation of the PSEGS power plant, the project owner shall provide a Power Tower Luminance Monitoring Plan as described above for review and approval by the CPM. The plan shall require the project owner to report any complaint to the CPM within 10 days of receiving the complaint. The project owner shall submit to the CPM an evaluation of the effects of the intensity of the luminance of light reflected from the power tower receivers:

1. Within 30 days following commercial operation of the PSEGS unit;
2. Within 90 days following commercial operation of the PSEGS unit;
3. After the first 5 years of operation;
4. If a major design change is implemented that results in an increase in the reflective luminance of the power tower; or
5. After receiving a legitimate complaint regarding visual distraction or discomfort glare associated with the power tower.

**TRANS-9** The project owner shall ensure that permits and/or licenses are secured from the CHP and Caltrans for the transport of hazardous materials.

**VERIFICATION:** In the MCRs, the project owner shall report permits and/or licenses for hazardous substance transportation received during that reporting period. In addition, the project owner shall retain copies of permits, licenses, and supporting documentation on site for CPM inspection if requested.

## C. SOCIOECONOMICS

### DESCRIPTION OF MODIFICATIONS

The amended project Palen Solar Electric Generating System (PSEGS) will occupy the same location as the certified project Palen Solar Power Plant (PSPP), but would reduce the project footprint from approximately 4,366 acres to approximately 3,794 acres. The changes from the approved PSPP to the PSEGS relevant to Socioeconomics involve the construction and operations workforce numbers (including the peak and average number of workers), duration of construction, and estimated fiscal benefits. The construction schedule for PSEGS would be 33 months rather than the approved PSPP's 39-month schedule. The construction workforce for the PSEGS would increase over the approved PSPP by 1,166 workers during peak construction, for a peak of 2,311 workers. The average number of construction workers for the PSEGS would increase by 432 workers for an average of 998 construction workers. The changes to the fiscal benefits are presented in **Socioeconomics - Table 13**. Nonetheless, construction and operation of the PSEGS would not cause a significant adverse direct or indirect impact on the area's housing, schools, law enforcement services, or parks. The project would not directly or indirectly induce a substantial population growth or displacement of population, or induce substantial increases in demand for housing, parks, or law enforcement services. However, when considered cumulatively with the other proposed and approved projects, temporary lodging may be constrained in the local and regional study areas, thus contributing to a cumulative impact. PSEGS operations would not create a significant adverse socioeconomic cumulative impact on the area's housing, schools, law enforcement services, or parks. (Ex. 2000, pp. 4.8-1, 4.8-3.)

The population residing in the six-mile project buffer does not constitute an environmental justice population as defined by *Environmental Justice: Guidance under the National Environmental Policy Act*, and would not trigger further scrutiny by the 13 technical areas for purposes of an environmental justice analysis.<sup>1</sup> Energy Commission Staff identified tribal entities that use the project area, as defined by *Environmental Justice: Guidance under the National Environmental Policy Act*. Impacts to this environmental justice population are analyzed in the **CULTURAL RESOURCES** section of this Decision. Refer to the **CULTURAL RESOURCES** section for more information. As discussed in the subsection "Project-Specific Demographic Screening," Staff notes that the Bureau of Land Management's (BLM) July 2013 PSEGS Draft Supplemental

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<sup>1</sup> The thirteen technical staff/areas are Air Quality, Hazardous Materials Management, Land Use, Noise and Vibration, Public Health, Socioeconomics, Soils and Surface Water Resources, Water Supply, Traffic and Transportation, Transmission Line Safety and Nuisance, Visual Resources, Cultural Resources, and Waste Management.

Environmental Impact Statement identified an environmental justice population (the unincorporated Riverside County community of Desert Center) where Energy Commission Staff did not. The factors leading to different identification conclusions for an environmental justice population are discussed in greater detail under the “Project-Specific Demographic Screening” heading in this section, and presented in **Socioeconomics Figures - 1** and **- 2**. (Ex. 2000, p. 4.8-1.)

The following evidence on socioeconomics was received into evidence on October 29, 2013: Exhibits 1003, 1021, 1026, 1046, 1052, 1060, 1076, 1101, 2000, and 2008. (10/29/13 RT 39:13 – 40:9.)

## **THE CERTIFIED PROJECT’S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that a large labor pool residing in the Riverside/San Bernardino/Ontario Metropolitan Statistical Area (MSA) is available within a two-hour commuting distance for construction and operation of the project. Over the 39-month construction period for the PSPP, an average of approximately 566 daily construction workers, with a peak daily workforce of 1,145, would have been required depending on the month and phase of development. The PSPP would have hired about 134 permanent full-time employees from the Riverside/San Bernardino/Ontario MSA for project operations. Accordingly, the decision concluded that the PSPP would not cause an influx of a significant number of construction or operation workers to permanently relocate to the local area. The decision found that there was an adequate supply of hotels/motels and rental properties within the project vicinity to accommodate workers who stay in the area temporarily during the week and commute to their homes on the weekend.

Because the industrial construction that would be subject to the statutory school development fee is located on federal property, the PSPP was exempt from paying the fee. Nonetheless, the PSPP Decision concluded that the original project would not result in significant adverse effects on local employment, housing, schools, public utilities, parks and recreation, law enforcement, or emergency services. Moreover, the decision noted that the anticipated construction payrolls, the local purchases of materials and supplies, and the sales tax revenues generated by the expenditures would have a beneficial effect on the local and regional economy. The anticipated annual operations payroll, annual local capital expenditures and materials, and indirect economic effects would have a beneficial effect on the local and regional economy and that the project would generate property tax revenues of approximately \$200,000 (2009 dollars) per year. Accordingly, the decision concluded that the PSPP would provide direct, indirect, and induced economic benefits to Riverside County and the surrounding communities.

Finally, the PSPP decision discussed the potential for that project to impact minority and/or low-income populations. The Commission concluded that the PSPP would not

create disproportionate impacts on minority and/or low-income populations because the mitigated project would not result in any significant health or environmental impacts to any population in the project vicinity.

In sum, the PSPP decision found that construction and operation of the project would not result in any direct, indirect, or cumulative significant adverse socioeconomic impacts. (PSPP Final Decision, CEC-800-2010-011, Socioeconomics, pp. 11-12.)

## **THE AMENDED PROJECT IMPACTS**

### **Methodology and Thresholds for Determining Significance**

CEQA requires a list of criteria to determine the significance of identified impacts. A significant impact is defined by CEQA as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (Cal. Code Regs., tit., 14, § 15382). (Ex. 2000, p. 4.8-2.)

Thresholds serve as the benchmark for determining if a project would result in a significant adverse impact when evaluated against existing conditions (e.g., “baseline” conditions). CEQA Guideline section 15064(e) specifies that: “[e]conomic and social changes resulting from the project shall not be treated as significant effects on the environment.” Section 15064(e) states that when “a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change would be a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant.” In this Decision, we have used Appendix G of the CEQA Guidelines for this analysis, which specifies that a project may have a significant effect on population, housing, law enforcement services, schools, and parks if the project would:

- induce substantial population growth in an area, either directly or indirectly;
- displace substantial numbers of people and/or existing housing, necessitating the construction of replacement housing elsewhere; or
- adversely impact acceptable levels of service for police protection, schools, and parks and recreation. (Ex. 2000, p. 4.8-2.)

We assess impacts on population, housing, police protection, schools, and parks and recreation based on the evidence presented, including professional judgments, input and data from local and state agencies, and the industry-accepted, two-hour commute range for construction workers, and one-hour commute range for operational workers. Typically, long-term employment of people from regions outside the study area could potentially result in significant adverse socioeconomic impacts. (Ex. 2000, p. 4.8-2.)

Criteria for subject areas such as utilities, fire protection, emergency medical services, water supply, and wastewater disposal are analyzed in the **RELIABILITY, WORKER SAFETY AND FIRE PROTECTION**, and **SOILS AND WATER RESOURCE** sections of this document. (Ex. 2000, p. 4.8-2.)

### **Regional Study Area**

For the purposes of assessing project impacts during construction, we define the regional study area as within a two-hour commute of the project. The regional study area is roughly defined by the distance construction workers are typically willing to commute daily to a project site, and includes Riverside County, California, San Bernardino County, California, and La Paz County, Arizona. (Ex. 2000, p. 4.8-4.)

The proposed PSEGS includes the construction and operation of a solar generating facility located in the Southern California inland desert, approximately 10 miles east of the small community of Desert Center in eastern Riverside County, California. (Ex. 2000, p. 4.8-4.)

To characterize the population and housing profile of the regional study area, current and forecasted population trends, as well as current housing trends for the study area, are summarized in **Socioeconomics - Table 1**. The regional study contains a high number of housing units, with San Bernardino and Riverside Counties contributing the largest number of vacant units in the PSEGS study area. Among all counties within the study area, La Paz County has the highest vacancy rate (43 percent). (Ex. 2000, p. 4.8-4.)

**Socioeconomics - Table 1**  
**Population and Housing Profile of the Regional Study Area**

Population							
Area	2000 <sup>1</sup>	2010 <sup>2</sup>	2020 <sup>4</sup> Projected	2030 <sup>4</sup> Projected	2040 <sup>4</sup> Projected	2050 <sup>4</sup> Projected	2060 <sup>4</sup> Projected
Riverside County, California	1,545,387	2,189,641	2,593,211	3,046,064	3,462,256	3,828,798	4,216,816
	1,545,387	2,189,641	2,592,000 <sup>5</sup>	3,324,000 <sup>5</sup>	—	—	
San Bernardino County, California	1,709,434	2,035,210	2,273,017	2,626,945	2,988,648	3,248,440	3,433,047
La Paz County, Arizona	19,579	22,632	21,988 <sup>6</sup>	23,615 <sup>6</sup>	25,351 <sup>6</sup>	27,710 <sup>6</sup>	—
Housing <sup>3</sup>							
Area	2010 Total Housing Units	2010 Occupied Housing Units	2010 Vacant Housing Units	2010 Vacancy Rate			
Riverside County, California	800,707	686,260	114,447	14%			
San Bernardino County, California	699,637	611,618	88,019	13%			
La Paz County, Arizona	16,049	9,198	6,851	43%			
Notes: — Data not available Source: <sup>1</sup> US Census 2000; <sup>2</sup> US Census 2010a; <sup>3</sup> US Census 2010b; <sup>4</sup> CA DOF 2013; <sup>5</sup> SCAG 2012; <sup>6</sup> AZ Dept. of Admin 2012.							

(Ex. 2000, p. 4.8-4.)

### Local Study Area

The analysis in evidence defines the local study area during project operation as within a one-hour commute of the project. An analysis at a local level presents a challenge because the proposed PSEGS is in a sparsely populated area with the largest urban center being the City of Riverside located approximately 100 miles west of the site. A reasonable study area for localized socioeconomic impacts would include the two nearest communities, namely the City of Blythe, California (approximately 25 miles east of the PSEGS site) and the City of Ehrenburg, Arizona (approximately 30 miles east of the PSEGS site). The most recently published population and housing data for these communities is presented below in **Socioeconomics - Table 2**. As Desert Center is the closest community to the project site, population and housing data for Desert Center has been included in the table even though this community is sparsely populated. (Ex. 2000, p. 4.8-5.)

**Socioeconomics - Table 2  
Population and Housing Profile of the Local Study Area**

Population						
Area	2000	2010	2020	2030		
Blythe, California	12,155	20,817	22,700	24,300		
Desert Center, California	—	204	—	—		
Ehrenburg, Arizona	1,357	1,470	—	—		
Quartzsite, Arizona	3,354	3,677	—	—		
Housing						
Area	Total Housing Units	Occupied Housing Units	Vacant Housing Units	Vacancy Rate	For Sale	For Rent
Blythe, California	5,473	4,513	960	18%	26%	10%
Desert Center, California	140	85	55	39%	24%	11%
Ehrenburg, Arizona	948	645	303	32%	16%	7%
Quartzsite, Arizona	3,378	2,027	1,351	40%	6%	8%
Notes: — Data not available Sources: US Census 2000; US Census 2010a; US Census 2010b; CA DOF 2013; SCAG 2012, AZ Dept. of Admin 2012.						

(Ex. 2000, p. 4.8-5.)

### Using the 2010 US Census and US Census Bureau's American Community Survey

The detailed social, economic, and housing information previously collected only in the decennial census was not collected for the 2010 Census. This information is now collected through the U.S. Census Bureau's American Community Survey (ACS). Decennial census data are from a 100 percent count collected once every 10 years and represent information from a single reference point (April 1). The main function of the decennial census is to provide counts of people for the purpose of congressional apportionment and legislative redistricting. ACS estimates are collected from a sample of the population based on information compiled continually and aggregated into one-, three-, and five-year estimates ("period estimates") released every year. The primary purpose of the ACS is to measure the changing social and economic characteristics of the U.S. population. As a result, the ACS does not provide official counts of the population in between censuses. Instead, the Census Bureau's Population Estimates

Program will continue to be the official source for annual population totals, by age, race, Hispanic origin, and sex. (Ex. 2000, p. 4.8-6.)

ACS collects data at every geographic level from the largest level (nation) to the smallest level available (block group [BG]).<sup>2</sup> Census Bureau Staff recommends the use of data from units no smaller than the census tract level.<sup>3,4</sup> Data from the five-year estimates are used for Staff's analysis as it provides the greatest detail at the smallest geographic level. Because ACS estimates come from a sample population, a certain level of variability is associated with these estimates. This variability is expressed as a margin of error (MOE). The MOE is used to calculate the coefficient of variation (CV). CVs are a standardized indicator of the reliability of an estimate. While not a set rule, the U.S. Census Bureau considers the use of estimates with a CV of more than 15 percent a cause for caution when interpreting patterns in the data (US Census 2009). In situations where CVs for estimates are high, the reliability of an estimate improves by using estimates for a larger geographic area (e.g., city or community versus census tract), or by aggregating estimates of adjacent geographic areas such as cities. (Ex. 2000, p. 4.8-6.)

### **Project-Specific Demographic Screening**

Demographic screening for PSEGS is based on information contained in two documents: *Environmental Justice: Guidance Under the National Environmental Policy Act* and *Final Guidance for Incorporating Environmental Justice Concerns in EPA's Compliance Analyses* (US EPA 1998). The purpose of this analysis is to identify potentially sensitive populations that could be disproportionately impacted by the proposed action. Because of the changes in the data collection methods used by the U.S. Census Bureau, as outlined above, we use a screening process that relies on 2010 U.S. Census data to determine the number of minority populations and data from the

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<sup>2</sup> Census Block Group (BG) - A statistical subdivision of a census tract. A BG consists of all tabulation blocks whose numbers begin with the same digit in a census tract; for example, for Census 2000, BG 3 within a census tract includes all blocks numbered between 3000 and 3999. The block group is the lowest-level geographic entity for which the Census Bureau tabulates sample data from the decennial census. <http://www.census.gov/dmd/www/glossary.html>.

<sup>3</sup> Census Tract - A small, relatively permanent statistical subdivision of a county or statistically equivalent entity, delineated for data presentation purposes by a local group of census data users or the geographic staff of a regional census center in accordance with Census Bureau guidelines. Census tracts are designed to be relatively homogeneous units with respect to population characteristics, economic status, and living conditions at the time they are established. Census tracts generally contain between 1,000 and 8,000 people, with an optimum size of 4,000 people. Census tract boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features. <http://www.census.gov/dmd/www/glossary.html>.

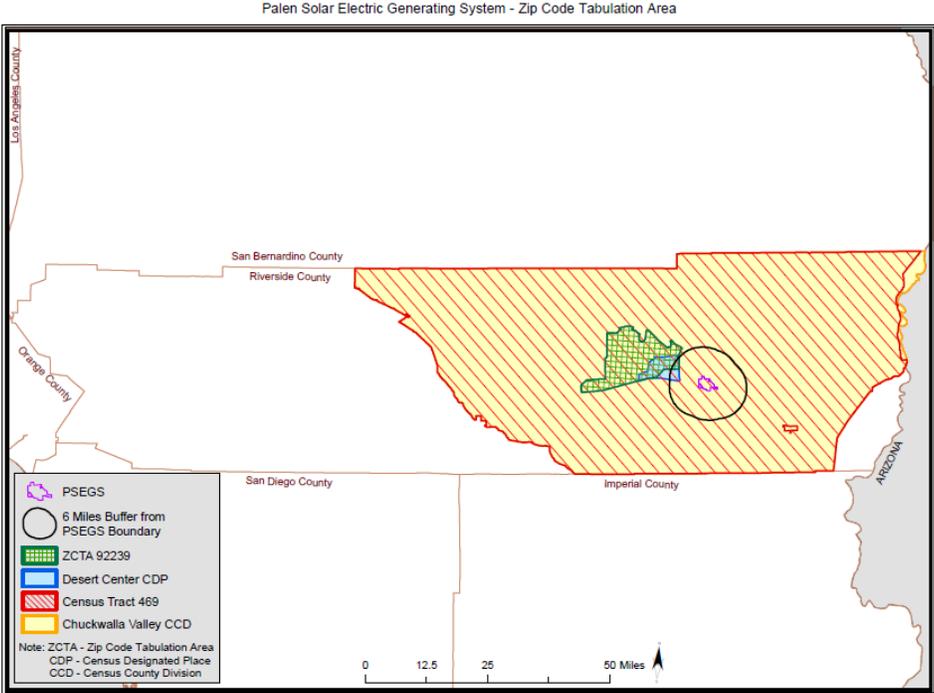
<sup>4</sup> Using the American Community Survey (ACS) and the New American Factfinder (AFF). Census Workshop presented by Barbara Ferry, U.S. Census Partnership Data Services Specialist, hosted by Sacramento Area Council of Governments, May 11–12, 2011.

2007–2011 ACS to evaluate the presence of individuals and households living below the federal poverty level. (Ex. 2000, p. 4.8-7.)

The demographic screening is designed to identify the presence of minority and below-poverty-level populations residing within a six-mile area of the proposed project site. The six-mile buffer is based on air quality modeling, which shows that project-related impacts from pollutants decrease to less than significant within six miles of the emission site. Staff uses the six-mile buffer to determine the area of potential project impacts and to obtain data to gain a better understanding of the demographic makeup of the communities potentially impacted by the project. Once an environmental justice population has been identified, the analysis shifts to the technical areas of this Decision to determine whether there are potential disproportionate impacts on the environmental justice population. If we do not identify the population in the six-mile buffer as an environmental justice population, as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, our analysis ends. (Ex. 2000, p. 4.8-7.)

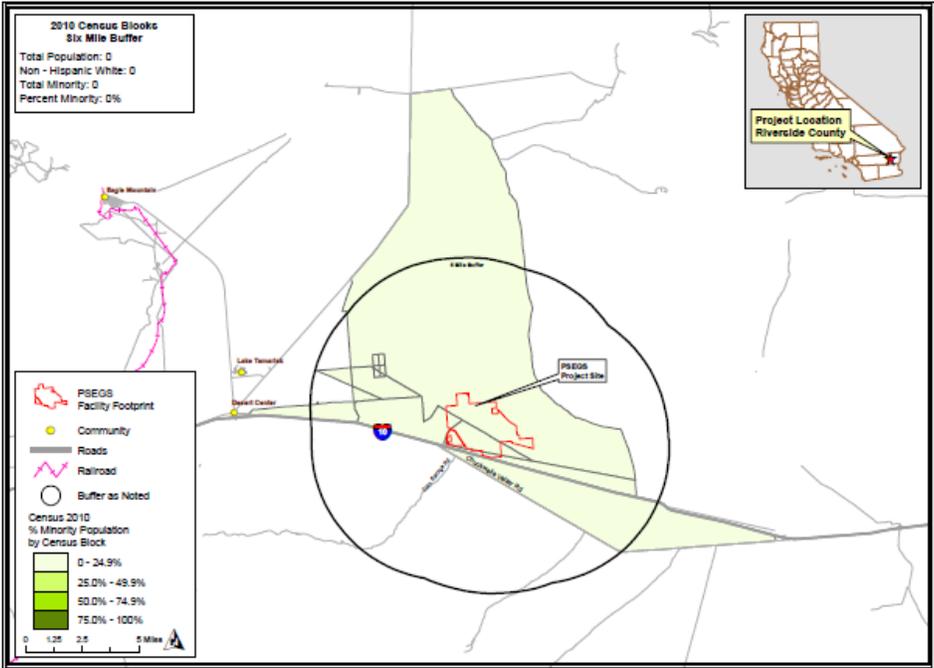
As discussed in the **PROJECT DESCRIPTION** section, concurrently with our review the BLM is conducting its own environmental review under the National Environmental Protection Act. In its July 2013 PSEGS draft *Supplemental Environmental Impact Statement*, specifically the section on *Environmental Justice*, the BLM determined that there was an environmental justice population (Desert Center) that may be impacted by the PSEGS. However, we note that the BLM used the 2007 – 2011 ACS Zip Code Tabulation Area (ZCTA) “92239” to determine the presence or absence of an environmental justice population. The Energy Commission, on the other hand, used 2010 census data for the geographies identified in **Socioeconomics - Table 3**. To provide the reader a comparison of the geographies used to identify an environmental justice population, **Socioeconomics - Figure 1** shows the different census geographies used by the BLM and Staff. Despite identifying an environmental justice population, the BLM nonetheless concluded that there were no disproportionate adverse impacts from the PSEGS to the BLM-identified environmental justice population at Desert Center. We also concluded that there is no disproportionate impact on an environmental justice population within six miles of the PSEGS site. (Ex. 2000, p. 4.8-7.)

# Socioeconomics - Figure 1 - Different Census Geographies used by the BLM and Energy Commission Staff



(Ex. 2000, Socioeconomics Figure 2)

# Socioeconomics - Figure 2 - Census 2010 Minority Population by Census Block-Six Mile Buffer



(Ex. 2000, Socioeconomics - Figure 1)

## Minority Populations

According to *Environmental Justice: Guidance Under the National Environmental Policy Act*, minority individuals are defined as members of the following groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. An environmental justice population is identified when the minority population of the potentially-affected area is greater than 50 percent or meaningfully greater than the minority population in the general population or other appropriate unit of geographical analysis. **Socioeconomics - Figure 2** shows that, based on census data, there are no people within a six-mile buffer of the project site. **Socioeconomics - Table 3** presents the minority population data for the community of Desert Center, plus Riverside County and the Chuckwalla Census County Division (CCD) for reference. The 2010 decennial census data show there is no population (minority or otherwise) in the six-mile project buffer. Therefore, there is no environmental justice population as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act* that would trigger further scrutiny for purposes of an environmental justice analysis. (Ex. 2000, pp. 4.8-7 – 4.8-8.)

**Socioeconomics - Table 3**  
**Minority Population in the Project Area**

	Six-Mile Buffer Around Project Site	Desert Center CDP	Chuckwalla Valley CCD	Riverside County
Total	0	204	9,843	2,189,641
Not Hispanic or Latino: White alone	0	156	4,349	869,068
Minority	0	48	5,494	1,320,573
Percent Minority	0	24	56	60
Notes: CDP – Census Designated Place, CCD – Census County Division.				
Source: US Census Bureau 2010c.				

(Ex. 2000, p. 4.8-8.)

## Below-Poverty-Level Populations

The poverty status of households and individuals is determined based on a set of income thresholds set by the U.S. Census Bureau that vary by family size and composition. If the total income of the family is less than the threshold set by the Census Bureau, that family and every individual in it is considered in poverty. The official poverty thresholds do not vary by geography (e.g., state, county, etc.), but are

updated annually to allow for changes in the cost of living. The population for whom poverty status is determined does not include institutionalized people, people in military quarters, people in college dormitories, and unrelated individuals less than 15 years of age. (Ex. 2000, p. 4.8-8.)

The evidence presented showed the below-poverty-level population in the project area using county level data from the 2007-2011 ACS Five-Year Estimates from the U.S. Census (US Census 2011b). We utilize the data at the county level in order to retain reasonable accuracy. The data represents a period estimate, meaning the numbers represent an area’s characteristics for the specified time period. (Ex. 2000, p. 4.8-8.)

Using this data set, we conclude that approximately 14 percent of the people, or 8,482 people, in Riverside County live below the federal poverty threshold. **Socioeconomics - Table 4** presents poverty data for Riverside County, plus California, for reference purposes. Poverty data for the Chuckwalla Valley CCD and Desert Center CDP was not included because the CV values were greater than 20, indicating that the data was unreliable and may not accurately reflect local characteristics. (Ex. 2000, p. 4.8-8.)

**Socioeconomics - Table 4  
Poverty Data in the Project Area**

Area	Total			Income in the past 12 months below poverty level			Percent below poverty level		
	Estimate*	MOE	CV	Estimate	MOE	CV	Estimate	MOE	CV
Riverside County	2,119,466	±1,760	0.05	301,763	±8,482	1.71	14.20	±0.4	1.71
California	36,211,794	±3,530	0.01	5,211,481	±39,013	0.46	14.40	±0.1	0.42
Note: *Population for whom poverty status is determined.									
Source: U.S. Census 2011b.									

(Ex. 2000, p. 4.8-9.)

**Additional Environmental Justice Population Considerations**

*Final Guidance for Incorporating Environmental Justice Concerns in EPA’s Compliance Analyses* also encourages outreach to community-based organizations and tribal governments early in the screening process to identify the presence of distinct minority communities residing within, or in close proximity to, the proposed project site. It also encourages identification of minority groups that utilize or hold sacred certain natural and cultural resources that may be affected by the proposed action. (Ex. 2000, p. 4.8-9.)

For information regarding the Energy Commission’s outreach program and consultations with local Native American communities, see the **CULTURAL**

**RESOURCES** section of this Decision. The **CULTURAL RESOURCES** section of this Decision identifies tribal entities that are associated with the project area. Therefore, this environmental justice population, as defined by *Environmental Justice: Guidance Under the National Environmental Policy Act*, triggers further scrutiny in the **CULTURAL RESOURCES** section of this Decision for purposes of an environmental justice impacts analysis. (Ex. 2000, p. 4.8-9.)

## **ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION**

### **Induce Substantial Population Growth**

For the purpose of this analysis, we define “induce substantial population growth” as workers moving into the project area because of project construction and operation, thereby encouraging construction of new homes or extension of roads or other infrastructure. To determine whether the project would induce population growth, we look to the availability of the local workforce and the population within the region. Here, the applicable “local workforce” for the PSEGS project is the Riverside/San Bernardino/Ontario Metropolitan Statistical Area (MSA),<sup>5</sup> which includes both Riverside and San Bernardino Counties. While the City of Ehrenberg within La Paz County, Arizona is located within the PSEGS regional study area and could contribute to the local workforce, detailed labor skill data are unavailable for this limited portion of the regional and local study area. As shown above in **Socioeconomics - Table 2**, due to the size of the La Paz County population, presenting local workforce data for the entire State of Arizona would not be representative of the available workforce within the county. However, it should be noted that construction workforce from within this county and local communities would contribute to the local workforce, as identified in detail below. We focus on the cities and communities along the Interstate-10 corridor, as this route provides the most reasonable access to the PSEGS site. Access to the site from other parts of Riverside, San Bernardino, and La Paz Counties is not as convenient. (Ex. 2000, pp. 4.8-9 – 4.8-10.)

### **Construction**

The project owner expects that construction of the proposed PSEGS would be similar to the approved PSPP. Construction of the PSEGS would last for 33 months, while construction of the approved PSPP was 39 months. The construction workforce would increase from an average of approximately 566 daily construction workers, peaking with a daily workforce of 1,145, to an average of approximately 998 workers, with a peak workforce of 2,311 workers. This peak employment number is used to analyze worst-case construction population and employment impacts. **Socioeconomics - Table 5**

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<sup>5</sup> Metropolitan Statistical Areas are geographic entities defined by the U.S. Office of Management and Budget (OMB) for use by federal and state statistical agencies in collecting, tabulating, and publishing socioeconomic statistics.

shows Years 2010–2020 occupational employment projections for the Riverside/San Bernardino/Ontario MSA by construction labor skill. The number of construction workers by trade for the PSEGS peak month (month 22) is presented in **Socioeconomics - Table 5** and compared with the construction workforce needed for the approved PSPP. The peak number of construction workers by trade is reported in parenthesis where different from the PSEGS peak construction month. (Ex. 2000, p. 4.8-10.)

As shown in **Socioeconomics - Table 5**, there is adequate local availability of construction workforce within the Riverside/San Bernardino/Ontario MSA for the approved PSPP and, given the relatively small increase in total number of workers for the PSEGS, we find it reasonable to conclude there would be adequate local availability of workforce for the PSEGS. (Ex. 2000, p. 4.8-12.)

**Socioeconomics - Table 5**  
**Total Labor by Skill in Riverside/San Bernardino/Ontario MSA**  
**and Construction Worker by Craft, Peak Month**

Trade	Total Workers for Construction by Craft (peak month)		Riverside/ San Bernardino/ Ontario MSA	
	Approved PSPP Project	PSEGS	2010	2020
Surveyor	12	4 (16*)	440	520
Operator <sup>1</sup>	90	106	2,510	3,030
Laborer <sup>2</sup>	185	86 (122*)	11,870	13,380
Truck Driver <sup>3</sup>	35	26 (34*)	22,530	28,960
Oiler <sup>4</sup>	4	0	52,650	57,040
Carpenter	100	75 (125*)	10,140	10,450
Boilermaker <sup>4</sup>	11	264	52,650	57,040
Paving Crew	0	0 (8*)	400	490
Pipe Fitter	326	508	3,160	3,570
Pipe Layer	0	3	590	730
Electrician	150	359	4,000	4,520
Cement Finisher	100	9 (18*)	2,420	2,570
Ironworker <sup>5</sup>	59	126 (132*)	700	670
Millwright	25	141 (149*)	140	140
Tradesman <sup>2</sup>	10	Included with laborer	11,870	13,380
Project Manager <sup>6</sup>	3	19	5,000	5,490
Construction Manager <sup>6</sup>	3	79	5,000	5,490
PM Assistant <sup>6</sup>	4	43	5,000	5,490

Support <sup>7</sup>	4	130	13,430	15,360
Support Assistant <sup>8</sup>	4	178	38,240	43,010
Engineer	10	104	7,270	8,120
Timekeeper	3	10	1,840	2,120
Administrator <sup>9</sup>	6	29	4,540	5,240
Welder	1	Included with boilermaker & pipefitter	2,650	3,090
Instrument Tech <sup>10</sup>		12	620	680
NOTES: 1 - THE "OPERATING ENGINEERS AND OTHER CONSTRUCTION EQUIPMENT OPERATORS" CATEGORY WAS USED. 2 - THE "CONSTRUCTION LABORERS" CATEGORY WAS USED. 3 - THE "HEAVY AND TRACTOR TRAILER TRUCK DRIVERS" CATEGORY WAS USED. 4 - THE "CONSTRUCTION TRADES WORKERS" CATEGORY WAS USED. 5 - THE "STRUCTURAL IRON AND STEEL WORKERS" CATEGORIES WERE USED. 6 - THE "CONSTRUCTION MANAGERS" CATEGORY WAS USED. 7 - THE "BOOKKEEPING, ACCOUNTING, AND AUDITING CLERKS" CATEGORY WAS USED. 8 - THE "OTHER OFFICE AND ADMINISTRATIVE SUPPORT WORKERS" CATEGORY WAS USED. 9 - THE "FIRST-LINE SUPERVISORS OF OFFICE AND ADMINISTRATIVE SUPPORT WORKERS" CATEGORY WAS USED. 10 - THE "CONTROL AND VALVE INSTALLERS AND REPAIRERS, EXCEPT MECHANICAL DOOR" CATEGORY WAS USED. *LARGEST NUMBER OF WORKERS BY TRADE. WHERE NO NUMBER IS INCLUDED IN PARENTHESIS, NUMBER REPORTED IS THE LARGEST NUMBER OF WORKERS FOR THE TRADE AND DURING THE PEAK PROJECT MONTH, MONTH 22. SOURCES: SOLAR MILLENNIUM 2009A, TABLES 5.11-8 AND 5.11-17; EDD 2012; PALEN 2012A; PALEN 2013MM.				

(Ex. 2000, p. 4.8-11.)

The amendment did not include the project owner's estimations of the proportion of construction workers who would temporarily relocate closer to the project site versus those who would commute daily. In the decision approving the PSPP, we found that up to 15 percent of construction workers would seek local lodging during the workweek, and up to 85 percent would commute daily. We find that these same percentages are reasonable for PSEGS as well. Therefore, for the PSEGS peak construction, up to 347 workers would seek local lodging, which represents an increase of 175 workers over the approved PSPP project. (Ex. 2000, p. 4.8-12.)

### Hotel/Motel

**Socioeconomics - Table 6** identifies over 12,900 motel/hotel rooms within a two-hour commute of the project site in selected cities in Riverside County and the nearby communities of Ehrenberg and Quartzsite in Arizona. (Ex. 2000, p. 4.8-12.)

**Socioeconomics - Table 7**  
**Hotel/Motel Supply within the PSEGS Regional and Local Study Areas**

Geographic Area	Hotels/Motels	Total Number of Rooms
Bermuda Dunes, California	1	Data not available
Blythe, California	21	1,032
Cathedral City, California	3	234
Coachella, California	0	0
Desert Center, California	0	0
Indian Wells, California	5	1,508
Indio, California	13	808
Mecca, California	0	0
Mesa Verde, California	0	0
Palm Desert, California	14	2,300
Palm Springs, California	55	5,232
Palo Verde, California	0	0
Rancho Mirage, California	6	1,598
Ripley, California	0	0
Thermal, California	0	0
Thousand Palms, California	1	116
Ehrenberg, Arizona	1	84
Quartzsite Arizona	1	50
Totals	121	12,962
Sources: BS 2011a, adapted from Table 5.10-6, pg. 5.10-16.		

(Ex. 2000, p. 4.8-12.)

### Housing Vacancy

As shown in **Socioeconomics - Table 3**, the closest community to the PSEGS site, Desert Center, had a 39 percent vacancy rate with 55 vacant housing units available in 2010. The City of Blythe had a larger vacant housing supply with 960 units, for an 18

percent vacancy rate. A five percent vacancy rate is largely accepted as a minimum benchmark for a sufficient amount of housing available for occupancy. **Socioeconomics - Table 7a** presents a more detailed look at the housing supply within a two-hour commute of the PSEGS, and **Socioeconomics - Table 7b** presents a more detailed look at the type of vacancy available. In 2010, a total of 43,559 vacancies, representing a 28 percent vacancy rate, were available in the cities and communities within the regional study area. As presented in **Socioeconomics - Table 7b**, the vacant housing supply shows a total of 6,585 of the vacancies were available for rent, 4,007 vacancies were available for sale, and 28,536 vacancies were available for seasonal, recreational, or occasional use. The housing counts in the study area indicate a greater supply of available housing units than demand. (Ex. 2000, pp. 4.8-12 – 4.8-13.)

**Socioeconomics - Table 7a**  
**Housing Unit Supply within the PSEGS Regional and Local Study Areas**

Geographic Area	Total	Occupied	Vacant	Percent Vacant
Bermuda Dunes, CDP, California	3,639	2,942	697	19
Blythe, California	5,473	4,513	960	18
Cathedral City, California	20,995	17,047	3,948	19
Coachella, California	9,903	8,998	905	9
Desert Center CDP, California	140	85	55	39
Indian Wells, California	5,137	2,745	2,392	46
Indio, California	28,971	23,378	5,593	19
Mecca, CDP, California	2,020	1,854	166	8
Mesa Verde CDP, California	360	312	48	13
Palm Desert, California	37,073	23,117	13,956	38
Palm Springs, California	34,794	2,274	12,048	35
Palo Verde CDP, California	211	84	127	60
Ripley, CDP, California	295	218	77	26
Thermal, CDP, California	761	684	77	10
Thousand Palms, CDP, California	3,705	2,849	856	23
Ehrenberg, CDP, Arizona	948	645	303	32
Quartzsite, Arizona	3,378	2,027	1,351	40
Total	157,803	93,772	43,559	28
<b>Counties</b>				
Riverside County, California	800,707	686,260	114,447	14
La Paz County, Arizona	16,049	9,198	6,851	43
*CDP – Census Designated Place				
Source: US Census Bureau 2010b.				

**Socioeconomics - Table 7b**  
**Vacancy Status within the PSEGS Regional and Local Study Areas**

Geographic Area	Vacant		For Rent		For Sale		Seasonal, Recreational, or Occasional Use		Other Vacant	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Bermuda Dunes, CDP, California	697	19	298	43	80	11	250	36	69	10
Blythe, California	960	18	248	26	100	10	448	47	167	17
Cathedral City, California	3,948	19	786	20	472	12	2,138	54	552	14
Coachella, California	905	9	197	22	388	43	104	12	216	24
Desert Center CDP, California	55	39	13	24	6	11	23	42	13	24
Indian Wells, California	2,392	46	85	4	124	5	2,028	85	155	6
Indio, California	5,593	19	1,166	21	810	14	2,986	53	631	11
Mecca, CDP, California	166	8	100	60	9	5	17	10	40	24
Mesa Verde, CDP, California	48	13	33	69	5	10	5	10	5	10
Palm Desert, California	13,956	38	1,616	12	798	6	10,418	75	1,124	8
Palm Springs, California	12,048	35	1,744	14	974	8	8,151	68	1,179	10
Palo Verde CDP, California	127	60	10	8	7	6	91	72	19	15
Ripley, CDP, California	77	26	49	64	2	3	4	5	22	29

Geographic Area	Vacant		For Rent		For Sale		Seasonal, Recreational, or Occasional Use		Other Vacant	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Thermal, CDP, California	77	10	30	39	2	3	6	8	39	51
Thousand Palms, CDP, California	856	23	85	10	102	12	565	66	104	12
Ehrenberg, CDP, Arizona	303	32	47	16	22	7	215	71	19	6
Quartzsite, Arizona	1,351	40	78	6	106	8	1,087	81	80	6
Total	43,559	28	6,585	15	4,007	9	28,536	66	4,434	10
Counties										
Riverside County, California	114,447	14	25,547	16	18,417	16	50,538	44	21,945	19
La Paz County, Arizona	6,851	43	586	5	370	5	5,318	78	577	8
*CDP – Census Designated Place; ** Other Vacant includes “rented, not occupied, sold, not occupied, migratory workers, and other vacant”										
Source: US Census Bureau 2010b										

(Ex. 2000, p. 4.8-14.)

## Campground/RV Parks

**Socioeconomic - Table 8** shows abundant RV park spaces in the Blythe, Ehrenberg, and Quartzsite areas. However, RV parks in Blythe tend to be located along the Colorado River and receive higher levels of use during the summer, thereby possibly reducing availability for construction workers. (Ex. 2000, p. 4.8-15.)

**Socioeconomics - Table 8**  
**RV Parks near the PSEGS Site**

Geographic Area	RV Spaces
Blythe, California	795
Ehrenberg, Arizona	94
Quartzsite, Arizona	1,876
Sources: BS 2011a, adapted from Table 5.10-7, pg. 5.10-17; URS 2012a.	

(Ex. 2000, p. 4.8-15.)

For the approved PSPP, we found that while these RV parks have a large number of spaces, many are occupied by year-round residents or are privately owned and would not be available for use by construction workers. Additional RV parks are located in Ehrenberg, Arizona, and Quartzsite, Arizona, approximately four miles and 20 miles east of Blythe, respectively. The town of Quartzsite's website states there are more than 70 RV parks in the vicinity of the community that are typically occupied between October and March, with visitors attracted to the gem, mineral, and swap meet shows, which are popular tourist attractions in the area. (Ex. 2000, p. 4.8-15.)

## Lodging Availability and PSEGS Workforce

The evidence shows that many of the construction workers needed for the PSEGS are local residents in Riverside and San Bernardino Counties and carpool daily to project sites, generally three to four persons per vehicle. In addition, many of these workers stay in Indio, Blythe, and Ehrenberg. Few, however, travel as far as Quartzsite, Arizona. The evidence establishes that the construction workers for the current energy projects in Riverside County have not found any problems in securing lodging. (Ex. 2000, p. 4.8-15.)

Seasonal vacancy rates, especially in Blythe, have not posed a problem for construction workers seeking lodging for other solar power plant projects. In general, out-of-the-area visitors seek local lodging only two times per year, namely in January when Quartzsite

holds a rock and gem show, and during dove season in September. Lodging during these times is a little more difficult, but can be found. When construction workers secure lodging for extended construction periods they are not subject to the higher seasonal room rates. Construction workers often share rooms to reduce costs and, as they rent rooms for long periods, they can often negotiate room rates. (Ex. 2000, p. 4.8-15.)

The evidence presented established that construction workers typically seek lodging close to a freeway with easy on-off access, and proximity to convenience stores, gas stations, and dining options. Construction workers who commute to a project site typically do not look for amenities like movie theaters or retail shopping because they return to their primary residences on the weekend. We find that construction workers employed on the PSEGS would not seek lodging in Palm Springs, Palm Desert, La Quinta, or Indian Wells because of the high cost of lodging. The evidence shows that construction workers for the PSEGS would not seek lodging around Thermal, Mecca or other communities near the Salton Sea because these areas are too far from Interstate 10. Finally, we find it unlikely that construction workers would stay in Desert Center because there is no longer a gas station in the community. A further option for housing for some construction workers would be a private recreational vehicle park off Rice Road. (Ex. 2000, p. 4.8-16.)

Based on the evidence, we find that any construction workers seeking RV and campground lodging could find limited availability during January and September. However, ample local housing (hotel/motel and housing units) would be available to any construction worker seeking to relocate during construction. Because of the availability of short-term housing in the local study area, we find that construction of the PSEGS would not temporarily induce substantial growth or a concentration of population in the local study area. (Ex. 2000, p. 4.8-16.)

## **Operations**

The proposed PSEGS is expected to require 100 operational employees, compared with the 134 permanent operational employees that were required for the approved PSPP. **Socioeconomics - Table 9** shows Years 2010-2020 occupational employment projections for the Riverside/San Bernardino/Ontario MSA by operational labor skill, and the estimated total number of operational workers needed for the PSEGS, along with the number needed for the approved PSPP. (Ex. 2000, p. 4.8-16.)

**Socioeconomics - Table 9**  
**Total Labor by Skill in Riverside/San Bernardino/Ontario MSA and Required Operations Workers**

Trade	Total Workers for Project Operation		Riverside/ San Bernardino/ Ontario MSA	
	Approved PSPP Project	PSEGS	2010	2020
<b>Solar Field and Power Block Workers</b>				
Operating Engineers and Other Construction Equipment Operators	—	24	2,510	3,030
<b>Technicians</b>				
Electrical and Electronics Repairers, Powerhouse, Substation and Relay	—	10	100	120
Control and Valve Installers and Repairers	—	2	620	680
Maintenance Workers, Machinery	—	4	610	660
<b>Operators</b>				
First-Line Operators	—	3	4,450	4,780
Power Plant Operators	—	12	130	150
<b>Warehouse and Maintenance Personnel</b>				
Janitors and Cleaners	—	1	17,120	19,110
Stock Clerks and Order Filler	—	2	22,090	25,720
Electrical and Electronics Repairers, Power house, <b>Substation and Relay</b>	—	2	100	120
Mobile Heavy Equipment Mechanics	—	4	1,680	1,790
Maintenance Workers, Machinery	—	4	610	660
<b>Administrative Personnel</b>				
General and Operation	—	1	16,920	18,030
Electrical Engineer	—	1	660	740

Mechanical Engineer	—	1	1,050	1,150
Secretaries and Administrative Assistants	—	2	12,670	13,420
Office and Administrative Support Workers	—	2	7,570	8,520
First-Line Supervisors of Mechanics, Installers, and Repairers	—	5	3,690	4,170
<b>Miscellaneous Support</b>				
Bus & Truck Mechanics and Diesel Engine Specialists	—	2	3,170	3,790
First-Line Supervisors of Mechanics, Installers, and Repairers	—	2	3,690	4,170
Electrical and Electronics Repairers, Power house, Substation & Relay	—	4	100	120
Control and Valve Installers and Repairers	—	2	620	680
Maintenance Workers, Machinery	—	2	610	660
Mobile Heavy Equipment Mechanics	—	2	1,680	1,790
Secretaries and Administrative Assistants	—	2	12,670	13,420
Office and Administrative Support Workers	—	2	7,570	8,520
Power Plant Operators	—	2	130	150
<i>Total</i>	<i>134</i>	<i>100</i>	<i>95,040</i>	<i>105,860</i>
Sources: Solar Millennium 2009a, Table 5.11-8; Palen 2012a; Palen 2013ss; EDD 2012.				

(Ex. 2000, p. 4.8-17.)

Data for the Riverside/San Bernardino/Ontario MSA indicate that in the Year 2010, the employment sectors for the trades listed in **Socioeconomics - Table 9** contained a total of 95,040 workers, with Year 2020 forecasts for these employment sectors estimated at a total of 105,860 employees. The applicant for the approved PSPP estimated that 75 percent of operational workers would come from within the regional study area workforce, resulting in a potential influx of approximately 34 workers in the communities in the local study areas. With the reduction of operational workers for the PSEGS, Staff estimates 25 permanent workers could choose to live closer to the PSEGS site. Housing data shows that the vacancy rates for the Cities of Blythe, California, Ehrenberg, Arizona, and Quartzsite, Arizona, are 18, 32, and 40 percent, respectively.

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Even with seasonal variations in vacancy rates, 2010 Census data shows there was a total of 373 housing units available for rent and 228 housing units available for sale in Blythe, Ehrenberg, and Quartzsite combined. Given the possible addition of 25 permanent workers, ample local housing is available should these operational employees choose to relocate to the local study area. Additionally, as shown in **Socioeconomics - Table 1**, the regional study area provides a high number of available housing opportunities. The addition of up to 25 workers for the PSEGS operations to either the local or regional study area would not induce substantial growth or concentration of population in excess of available housing or forecasted growth. (Ex. 2000, p. 4.8-18.)

We, therefore, hold that inducement of substantial population growth would be a less-than-significant impact, under CEQA, which is consistent with the conclusion for the approved PSPP. (Ex. 2000, p. 4.8-18.)

### **Displace Existing Housing and Substantial Numbers of People**

The proposed PSEGS site is vacant undeveloped land, vegetated with desert scrub throughout and includes some sand dunes in the northeast. No housing structures exist on the property. Two residences exist west of the PSEGS site, but the residents and the homes would not be displaced by the construction or operation of the project. As such, no housing or persons would be displaced by the PSEGS. (Ex. 2000, p. 4.8-18.)

We conclude that the required construction workforce for the PSEGS would be found in the regional study area, consistent with the approved PSPP. An estimated 15 percent of workers could seek local lodging during the workweek. There appears to be sufficient lodging in the local and regional study area to house the 347 (at peak month) PSEGS construction workers without triggering the need for new housing. Vacancy rates within the local study area offer the 25 PSEGS operations employees wishing to relocate sufficient available housing. Therefore, we find that no significant construction or operation-related impacts are expected for the regional and local study area housing supply, availability, or demand, and the PSEGS would not displace any populations or existing housing, and it would not necessitate construction of replacement housing elsewhere. (Ex. 2000, p. 4.8-18.)

### **Result in Substantial Physical Impacts to Government Facilities**

Physical impacts to public services and facilities are usually associated with population in-migration and growth in an area, which can increase the demand for a particular service, leading to the need for expanded or new facilities. Public service providers serving the PSEGS site are located within Riverside County. Therefore, the study area for the public services analysis is limited to Riverside County. (Ex. 2000, p. 4.8-19.)

As discussed under the subject headings below, the PSEGS would not cause significant impacts to service ratios, response times, or other performance objectives relating to law enforcement, schools, or parks. (Ex. 2000, p. 4.8-19.)

Please refer to the **WORKER SAFETY AND FIRE PROTECTION** section of this document for a detailed discussion of fire protection and emergency medical services. (Ex. 2000, p. 4.8-19.)

### **Police Protection**

The PSEGS, like the approved PSPP, would be served by the Riverside County Sheriff's Department's Colorado River Station at 260 North Spring Street in Blythe, California. The Colorado River Station provides service to the unincorporated area from Red Cloud Road on the west, to the Arizona state line on the east, and from county line to county line on the north and south. Communities included in this service area are Desert Center, Eagle Mountain, East Blythe, Hayfield, Midland, Nicholls Warm Springs, Ripley, and the Colorado River. (Ex. 2000, p. 4.8-19.)

The Colorado River Station has 27 sworn officers and 10 non-sworn officers with 2 to 3 officers on duty per shift. The Colorado River Station is approximately 40 miles from the PSEGS site. (Ex. 2000, p. 4.8-19.)

The response time to the PSEGS site for a priority call is estimated at 30 minutes or more and a non-priority call is estimated at 45 minutes or more. There is a low probability that additional law enforcement services are needed during project construction and operation. The evidence from the sheriff's department estimated that there is a moderate probability that during construction the project-related traffic could affect circulation and access on roads near the project site to the extent that emergency response times might be affected. The **TRAFFIC AND TRANSPORTATION** section of this Decision imposes Condition of Certification **TRANS-1**, which requires the preparation and implementation of a traffic control plan to address the movement of workers, vehicles, and materials, including arrival and departure schedules and designated workforce and delivery routes. (Ex. 2000, p. 4.8-19.)

In order to provide security to lessen the potential impacts from the PSEGS construction and operation, Condition of Certification **SOCIO-1**, requires that the project owner construct total perimeter fencing, including illumination of access points. Condition of Certification **SOCIO-1** further requires that, gates at the project site not be obstructed. Finally, Condition of Certification **SOCIO-1** requires that the project owner post a "No Trespass" sign with the location address posted and visible, and a "No Trespassing" letter should be on file at the sheriff's station during construction and operation of the project. (Ex. 2000, p. 4.8-20.)

## **Construction**

The Hazardous Materials Management section of this document imposes Conditions of Certification **HAZ-4** and **HAZ-5**, which require the preparation of a Construction Site Security Plan and an Operation Security Plan to ensure site security. The plans also include a protocol for contacting law enforcement and the Energy Commission Compliance Project Manager (CPM) in the event of suspicious activity or emergency. Site security would minimize the potential need for the Riverside County Sheriff Department's assistance. (Ex. 2000, p. 4.8-20.)

During the peak construction month, up to 347 workers for the PSEGS could seek local lodging. This number is considered less than significant as these workers would most likely already live within the regional study area and would be part of the Riverside County Sheriff Department's population served. Also, the service standard for the Riverside County Sheriff's Department is one officer per 1,000 population. If all 347 workers were to temporarily relocate within this service area, the number of workers would still be less than significant because they would not trigger a need for additional sheriff staffing or services. While the PSEGS would increase the number of individuals within the local study area during construction, we find that the increase would not be substantial and would not necessitate new or expanded law enforcement facilities or staff levels within the PSEGS regional or local study areas. (Ex. 2000, p. 4.8-20.)

## **Operations**

As we found above, the operational workforce for the PSEGS is expected to be hired from within the regional workforce. It is possible that up to 25 operational employees for the PSEGS could choose to relocate to the PSEGS local area from more distant regional study area locations. Should operational employees permanently relocate to the local study area and purchase homes, they would contribute to the local community through the payment of property taxes based on the assessed value of the home at the time of sale. As it is likely a number of these employees already reside in Riverside County, relocation to the local area would not result in an increase over the total population policed by the Riverside County Sheriff's Department. As with construction-related impacts, the service standard for the Riverside County Sheriff's Department is one officer per 1,000 population. If all 25 workers were to relocate within this service area, the number of workers would still be less than significant because they would not trigger a need for additional sheriff staffing or services. Therefore, we find that operation of the PSEGS would not require the need for new or expanded law enforcement facilities or staff levels within the PSEGS regional or local study areas. (Ex. 2000, p. 4.8-20.)

## **Schools**

The PSEGS site area is served by the Palo Verde Unified School District (PVUSD), serving the City of Blythe and other remote areas of Riverside County, and the Desert Center Unified School District in Desert Center. **Socioeconomics - Table 10** identifies the schools plus the current and previous year's student enrollment data in each of the respective school districts. As shown, PVUSD, approximately 40 miles east of the PSEGS site, offers a full range of educational opportunities with three elementary schools, one middle school, one high school, and a continuation high school. Desert Center Unified School District, approximately 10 miles west of the PSEGS site, offers one elementary school. (Ex. 2000, p. 4.8-21.)

**Socioeconomics - Table 10**  
**Summary of Schools and Enrollment in Palo Verde and Desert Center School Districts**

School Name	Community	Grades	Students	Pupil-to-Teacher Ratio	Average Class Size
<b>Palo Verde Unified School District</b>					
Felix J. Appleby Elementary School	Blythe	K-5			
2012-2013			571	—	—
2011-2012			531	19.7	19.7
Margaret White Elementary School	Blythe	K-5			
2012-2013			668	—	—
2011-2012			683	27.3	28.5
Ruth Brown Elementary School	Blythe	K-5			
2012-2013			633	—	—
2011-2012			713	27.4	28.5
Blythe Middle School	Blythe	6-8			
2012-2013			502	—	—
2011-2012			502	15.9	18.0
Palo Verde High School	Blythe	9-12			
2012-2013			955	—	—
2011-012			955	22.1	25.3
Twin Palms Continuation School	Blythe	9-12			
2012-2013			102	—	—
2011-2012			92	18.4	17.4
<b>District Total</b>	Blythe	K-12			
2012-2013			3,448	—	—
2011-2012			3,486	22.0	22.4
<b>Desert Center Unified School District</b>					
Eagle Mountain Elementary School	Desert Center	K-8			
2012-2013			15	—	—
2011-2012			20	0	0
<b>Riverside County</b>					
Riverside County	County	K-12			
2012-2013			425,564	—	—
2011-2012			425,651	24.2	27.3
Source: CDE 2013					

(Ex. 2000, p. 4.8-21.)

### Construction

As we have previously found, the construction workforce for the PSEGS would be hired from within the available regional workforce, with up to 15 percent of workers potentially seeking temporary local housing during the workweek. This temporary local housing need would not result in substantial population in-migration occurring from PSEGS construction into the PVUSD. We do not expect that any construction workers seeking

local temporary housing would bring school-aged children seeking enrollment within the PVUSD, as workers would only seek local lodging during the workweek and return to their permanent homes on the weekend. Therefore, we find that construction of the PSEGS would not require the need for new or expanded school facilities or staff levels. (Ex. 2000, p. 4.8-22.)

### **Operation**

California Government Code section 65995(a) provides that only those fees expressly authorized by Education Code section 17620 or Government Code sections 65970 et seq. may be levied or imposed in connection with, or made conditions of, any legislative or adjudicative act by a local agency involving planning, use, or development of real property. Subdivision (h) of section 65995 declares that the payment of the development fees authorized by Education Code section 17620 is "full and complete mitigation of the impacts of any legislative or adjudicative act . . . on the provision of adequate school facilities." Section 65995(i) prohibits an agency from denying or refusing to approve a legislative or adjudicative act involving development "on the basis of a person's refusal to provide school facilities mitigation that exceeds the amounts authorized by state law. However, because the PSEGS is proposed on the BLM land, as was the approved PSPP's administration and warehouse space, the provisions of Education Code section 17620 would not apply, and no school impact fees would be collected for the PSEGS, as was the case for the approved PSPP. (Ex. 2000, p. 4.8-22.)

The operational workforce for the PSEGS is expected to be hired from the available regional workforce. Up to 25 operational employees for the PSEGS, a decrease from the estimated 34 employees for the approved PSPP could choose to relocate to the PSEGS local area from more distant regional study area locations. At the time the approved PSPP was under Energy Commission review, the PVUSD expected to have the necessary capacity to accommodate new students resulting from project operation. Based on the school data in **Socioeconomics - Table 10**, we find that any contribution of school-aged children from workers relocating for the PSEGS would account for a small increase in the overall PVUSD student body. With the decrease in the required operational PSEGS workforce from 34 to 25, we do not anticipate the impacts to school capacity to worsen. We, therefore, find that operation of the PSEGS would not necessitate new or expanded school facilities or staff levels within the PSEGS regional or local study areas, which was also the conclusion for the approved PSPP project. (Ex. 2000, p. 4.8-23.)

### **Parks and Recreation**

The PSEGS site is currently undeveloped, is not designated for active recreational use, and does not appear to be frequented as a recreational area. The nearest park facilities

to the PSEGS site are located within the City of Blythe, approximately 40 miles east of the PSEGS site. The City of Blythe's Parks Department is responsible for the maintenance and upkeep of the area's seven parks and one pocket park. (Ex. 2000, p. 4.8-22.)

### **Construction**

We have previously found that the construction workforce for the PSEGS would be hired from within the available regional workforce, with up to 15 percent of workers potentially seeking temporary local area housing during the workweek to avoid commuting. This temporary local housing need would not result in substantial population in-migration occurring from PSEGS construction into either the local or regional study areas. As discussed above, we have determined that camping and RV facilities would experience peak attendance from tourists during the summer and higher occupancy during the winter, thereby possibly reducing availability for construction workers seeking local area housing. Therefore, we conclude that as a result of the PSEGS, construction employment, like the approved PSPP construction employment, would not require new or expanded recreational facilities or staff levels within the PSEGS regional or local study areas. (Ex. 2000, pp. 4.8-22 – 4.8-23.)

### **Operation**

We have found that the operational workforce for the PSEGS is expected to come from within the available regional workforce. It is possible that up to 25 operational employees for the PSEGS could choose to relocate to the PSEGS local area from more distant regional study area locations. If any operational employees were to permanently relocate to the local study area, it is assumed that some percentage of this population would purchase homes and contribute to the local community through the payment of property taxes. Should operational employees permanently relocate to the local study area and purchase homes, they would contribute to the local community through the payment of property taxes based on the assessed value of the home at the time of sale. We, therefore, find that permanent employment associated with the PSEGS, like the approved PSPP, would not necessitate new or expanded parks and recreational facilities or staff levels within the PSEGS regional or local study areas. (Ex. 2000, p. 4.8-23.)

### **NON-OPERATION AND CLOSURE**

As described in the **PROJECT DESCRIPTION** section, the planned operational life of the PSEGS is 25-30 years from project start-up, but the facility conceivably could operate for a longer or shorter period depending on economic or other circumstances. If the PSEGS remains economically viable, it could operate for more than 30 years, which would defer environmental impacts associated with closure and with the development of

replacement power generating facilities. However, if the facility were to become economically non-viable before 30 years of operation, permanent closure could occur sooner. In any case, a Facility Closure Plan would be prepared three years prior to initiating a permanent facility closure and be put into effect when permanent closure occurs. If the PSEGS facility ceases operation temporarily, whether by plan or due to an unplanned incident (non-operation), a Repair/Restoration Plan for conducting the activities necessary to restore the facility to availability and reliable and/or improved performance would be prepared. In general, the Facility Closure Plan would address any long-term, post-closure site maintenance and monitoring for the PSEGS and all associated facilities, including activities necessary for site restoration/revegetation. If removal of all equipment and facilities is needed, recycling of facility components, collection and disposal of hazardous wastes, and resale of unused chemicals to other parties would be addressed in the Facility Closure Plan. Closure alternatives other than full site restoration, costs associated with the planned closure activities, funding sources for these activities, and conformance with applicable LORS would also be included in the Facility Closure Plan. (Ex. 2000, p. 4.8-23.)

The evidence indicates that the number and type of workers required for non-operation and closure activities would be similar to those described above for construction of the PSEGS. Also, the record indicates that, as for the construction of the PSEGS, 15 percent of the non-operation and closure workforce would temporarily relocate closer to the project site for non-operation and closure activities. The remaining 85 percent would be drawn from the regional and local study areas. As most workers are expected to reside within the study area, no impacts to existing population levels are expected to occur. Therefore, we conclude that, like the PSEGS construction workforce, the workforce for non-operation and closure would have no impacts on housing, population, and police services. No significant impacts to the study area population would result from proposed PSEGS non-operation and closure activities. (Ex. 2000, pp. 4.8-23 – 4.8-24.)

### **Cumulative Impacts**

A project may result in significant adverse cumulative impacts when its effects are “cumulatively considerable.” “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, or the effects of probable future projects (Cal. Code Regs., tit. 14, §15130). Cumulative socioeconomic impacts could occur when more than one project has an overlapping construction schedule that

creates a demand for workers that cannot be met by the local labor force, resulting in an influx of non-local workers and their dependents. Operational cumulative socioeconomic impacts could occur when the development of multiple projects significantly impacts the population of an area, resulting in a housing shortage, change in local employment conditions, and an increased demand on public services. (Ex. 2000, p. 4.8-24.)

Projects considered for the socioeconomic cumulative analysis are shown in **Socioeconomics - Table 11a** and **Socioeconomics - Table 11b**. Although not all of those projects are expected to complete the environmental review process, or to be funded and constructed, the list is indicative of the large number of large residential, commercial, and energy projects currently proposed in California. (Ex. 2000, p. 4.8-24.)

The projects used for this cumulative analysis are located in Riverside and San Bernardino Counties in California and La Paz County, Arizona. The geographic scope of cumulative impact analysis is based on the workforce boundaries of the cumulative development projects and is large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements. We consider a number of variables, including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. Most of these projects have, are, or would be required to undergo their own independent environmental review under CEQA and/or the National Environmental Protection Act (NEPA). (Ex. 2000, p. 4.8-24.)

### **Effects of Existing Projects**

A wide variety of past and present development projects contribute to the cumulative conditions for socioeconomics. As shown in **Socioeconomics - Table 1**, from 2000 to 2010, the populations of Riverside and San Bernardino Counties increased by 41.7 percent and 19.1 percent, respectively, while the population within La Paz County increased by 15.6 percent. This steady growth rate has occurred throughout the regional study area. As a result, past and present residential, commercial, and industrial development has contributed to the overall socioeconomic growth within the study area. (Ex. 2000, p. 4.8-24.)

### **Effects of Future Foreseeable Projects**

Socioeconomics would be affected by reasonably foreseeable future projects such as large electrical generation and distribution infrastructure development projects proposed along the I-10 corridor and solar and wind applications proposed on approximately 1,000,000 acres of the BLM land in the California Desert District Planning Area. Also, a large number of solar generation and distribution infrastructure development projects proposed on non-federal land in the I-10 corridor would affect socioeconomics (**Socioeconomics - Tables 11a and 11b**). (Ex. 2000, p. 4.8-25.)

**Socioeconomics - Table 11a  
Cumulative Project Construction Employment Needs and Labor Supply**

Trade	Total # of Workers for Project Construction by Craft – Peak Month						TOTAL	Riverside/San Bernardino/ Ontario MSA	
	<u>Approved PSPP Project</u> (Month 17)	<u>PSEGS</u> (Month 22)	<u>BSPP</u> (Month 16)	<u>GSEP</u> (Month 16)	<u>RSEP</u> (Month 12)	<u>DSPV</u> (Months 6-8)		2010	2020
Surveyor	12	4 (16*)	—	0	0	—	4 (16*)	440	520
Operator	90	106	—	0	0	—	106	2,510 <sup>1</sup>	3,030 <sup>1</sup>
Laborer	185	86 (122*)	—	198	52	—	336	11,870 <sup>2</sup>	13,380 <sup>2</sup>
Truck Driver	35	26 (34*)	—	0	0	—	26 (34*)	22,530 <sup>3</sup>	28,960 <sup>3</sup>
Oiler	4	0	—	0	0	—	0	52,650 <sup>4</sup>	57,040 <sup>4</sup>
Carpenter	100	75 (125*)	—	44	50	—	169	10,140	10,450
Boilermaker	11	264	—	0	0	—	264	52,650 <sup>4</sup>	57,040 <sup>4</sup>
Paving Crew	0	0 (8*)	—	0	0	—	0 (8*)	400	490
Pipe Fitter	326	508	—	200	80	—	780	3,160	3,570
Pipe Layer	0	3	—	0	0	—	3	590	730
Electrician	150	359	—	105	56	—	520	4,000	4,520
Cement Finisher	100	9 (18*)	—	4	6	—	19	2,420	2,570

Ironworker	59	126 (133*)	—	70	32	—	228	700 <sup>5</sup>	670 <sup>5</sup>
Millwright	25	141 (149*)	—	22	16	—	179	140	140
Tradesman	10	Included with laborer	—	382 <sup>6</sup>	105 <sup>7</sup>	—	487	11,870 <sup>2</sup>	13,380 <sup>2</sup>
Project Manager	3	19	—	0	0	—	19	5,000 <sup>8</sup>	5,490 <sup>8</sup>
Construction Manager	3	79	—	0	5	—	84	5,000 <sup>8</sup>	5,490 <sup>8</sup>
PM Assistant	4	43	—	0	0	—	43	5,000 <sup>8</sup>	5,490 <sup>8</sup>
Support	4	130	—	0	0	—	130	13,430 <sup>9</sup>	15,360 <sup>9</sup>
Support Assistant	4	178	—	0	0	—	178	38,240 <sup>10</sup>	43,010 <sup>10</sup>
Engineer	10	104	—	60	36	—	200	7,270	8,120
Timekeeper	3	10	—	0	0	—	10	1,840	2,120
Administrator	6	29	—	0	0	—	29	4,540 <sup>11</sup>	5,240 <sup>11</sup>
Welder	1	Included with boilermaker & pipefitter	—	0	0	—	0	2,650	3,090
Instrument Tech	0	12	—	0	0	—	12	620 <sup>12</sup>	680 <sup>12</sup>
<b>Total Peak Month</b>	<b>1,145</b>	<b>2,311</b>	<b>499</b>	<b>1,085</b>	<b>438</b>	<b>622</b>	<b>4,955<sup>13</sup></b>	<b>N/A</b>	<b>N/A</b>
<b>Local Housing Need<sup>14</sup></b>	<b>172</b>	<b>347</b>	<b>75</b>	<b>163</b>	<b>66</b>	<b>93</b>	<b>744</b>	<b>N/A</b>	<b>N/A</b>

Socioeconomics

Notes: — Data not available, N/A Not applicable. \*Largest number of workers by trade. Where no number is included in parenthesis, number reported is the largest number of workers for the trade and during the peak project month, month 22.

1 The Operating Engineers and Other Construction Equipment Operators” category was used. 2 “Construction Laborers” category was used. 3 The “Heavy and Tractor Trailer Truck Drivers” category was used. 4 The “Construction Trades Workers” category was used. 5 The “Structural Iron and Steel Workers” categories were used. 6 Includes: insulators, painters, teamsters, and ‘Solar Field Craft’. The solar field craft workers include an estimated five solar field installation crews, with each crew including a Foreman, Equipment Operators, Laborers, Electricians, Ironworkers, Carpenters, Masons, and Pipefitter/Welders. 7 Includes Teamsters, Heliostat Assembly Craft, Construction Staff, Subcontractors, and Technical Advisors. 8 The “Construction Managers” category was used. 9 The “Bookkeeping, Accounting, and Auditing Clerks” category was used. 10 The “Other Office and Administrative Support Workers” category was used. 11 The “First-Line Supervisors of Office and Administrative Support Workers” categories were used. 12 The “Control and Valve Installers and Repairers, except mechanical door” category was used. 13 Total reflects the combined total peak month numbers for the PSEGS, BSPP, GSEP, RSEP, and DSPV projects. 14 Assumes 15% of peak month workforce may seek temporary local housing during workweek.

Source: (Ex. 2000, p. 4.8-25 – 4.8-26)

### Socioeconomics - Table 11b Cumulative Projects for Socioeconomics

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
4	Line	Devers-Palo Verde No. 2 Transmission Line Project	From the Midpoint Substation to Devers Substation	SCE	CPUC petition to modify request to construct CA-only portion approved by CPUC 11/2009	New 500 kV transmission line parallel to the existing Devers-Palo Verde Transmission Line from Midway Substation, approximately 10 miles southeast of Blythe, to the SCE Devers Substation, near Palm Springs. The ROW for the 500 kV transmission line would be adjacent to existing DPV ROW	2
3	Line	Green Energy Express Transmission Line Project	Eagle Mountain Sub to So. California	Green Energy Express	Approved	70 mile double circuit 500 kV transmission line from Eagle Mt. Sub to So. California	2
5	Line	Blythe Energy Project Transmission Line	From the Blythe Energy Project to Julian Hinds	Blythe Energy, LLC	Existing	Transmission line modifications including upgrades to Buck Substation, approximately 67.4 miles of new 230 kV transmission line between Buck Substation and Julian Hinds Substation, upgrades to the Julian Hinds	2

Socioeconomics

7.3-36

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
			Substation			Substation, installation of 6.7 miles of new 230 kV transmission line between Buck Substation and SCE's DPV 500 kV transmission line	
14	Polygon	SCE Red Bluff Substation	South of I-10 at Desert Center	SCE	Approved	A proposed new 500/220 kV substation, 2 new parallel 500 kV transmission lines of about 2,500 to 3,500 feet each	6
12	Polygon	Chuckwalla Solar I	1 mile north of Desert Center	Chuckwalla Solar I	POD in to BLM	200 MW solar PV project on 4,083 acres	6
8	Polygon	Desert Lily Soleil Project	6 miles north of Desert Center	EnXco	POD in to BLM	100 MW PV plant on 1,216 acres of BLM land	7
11	Polygon	Desert Center 50	Desert Center	US Solar Holdings	Under review	A planned 49.5 MW fixed flat panel photovoltaic solar power plant	8
7	Polygon	Desert Harvest Solar Project	6 miles north of Desert Center	EnXco	Final document submitted on 11/7/2012	Project would be a 150-megawatt solar photovoltaic facility sited on 1,208 acres of BLM-managed lands north of the community of Desert Center in Riverside County, CA. An associated 220-kilovolt generation-intertie transmission line would be sited within a 204-acre right-of-way on BLM-managed land and 52 acres of non-BLM managed land, which would extend from the solar facility site to the planned Red Bluff Substation.	12

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
17	Polygon	Genesis Solar Energy Project	North of I-10, 25 miles west of Blythe, 27 miles east of Desert Center	NextEra (FPL)	Approved, under construction	250 MW solar power project on 1,950 acres north of the Ford Dry Lake. 6 mile natural gas pipeline and 5.5 mile gen-tie line to the Blythe Energy Center to Julian Hindes Transmission Line	12
3	Polygon	Desert Sunlight Project	6 miles north of Desert Center	First Solar	Approved	550 MW PV project on 4,144 acres of BLM land, requiring a 12 mile transmission to the planned Red Bluff Substation	14
26	Polygon	Graham Pass Wind Project	Riverside County	Graham Pass Inc	Pending	175 MW Wind Project	15
18	Polygon	EnXco	North of Wiley's Well Rd, east of Genesis Solar Project	EnXco	POD in to BLM	300 MW solar PV project	17
6	Point	Eagle Mountain Pumped Storage Project	Eagle Mountain iron ore mine, north of Desert Center	Eagle Crest Energy	FERC draft EIS published in 12/2010	1,300 MW pumped storage project on 2,200 acres of public and private land, designed to store off-peak energy to use during peak hours	20
25	Polygon	Mule Mountain III	Chuckwalla Valley	EnXco	Pending	200 MW Solar PV	22
6	Line	Desert Southwest Transmission Line	118 miles primarily parallel to DPV	Imperial Irrigation District	Approved	118 mile 500 kV transmission line from a new substation/switching station near the Blythe Energy Project to the existing Devers Substation located approximately 10 miles north of Palm Springs	24

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
13	Polygon	McCoy Solar Energy Project	North of I-10, south of McCoy Wash, east of McCoy Mountains, Riverside County	McCoy Solar, LLC	Record of Decision signed on March 13, 2013	750 megawatt (MW) photovoltaic (PV) solar energy generating facility and related infrastructure in unincorporated Riverside County, CA. About 7,700 acres of BLM land and 470 acres of private land.	25
10	Polygon	McCoy Soleil Project	10 miles northwest of Blythe	EnXco	Plan of Development to Palm Springs BLM	300 MW solar power tower project located on 1,959 acres. Requires a 14 mile transmission line to proposed SCE Colorado Substation south of I-10	25
15	Polygon	Blythe Solar Power Project	North of I-10, north of Blythe Airport	Solar Millennium	Approved	1,000 MW solar trough facility on 7,540 acres	26
22	Polygon	Desert Quartzite	South of I-10, 8 miles southwest of Blythe	First Solar	POD in to BLM	600 MW solar PV project located on 7,724 acres, adjacent to DPV transmission line and SCE Colorado Substation	28
5	Polygon	Big Maria Vista Solar Project	North of I-10, 12 miles N/W Blythe	Bullfrog Green Energy	POD in to BLM	500 MW PV project on 2,684 acres	29
27	Polygon	Palo Verde Mesa Solar Project	N/W Of Blythe	Renewable Resources Group	NOP Filed	486 MW Solar	29
19	Polygon	Blythe Energy Project II	Near Blythe Airport	Blythe Energy	Approved	520 MW combined-cycle power plant located entirely within the Blythe Energy Project site boundary, located on 30 acres of a 76 acre site	31

Socioeconomics

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
20	Point	Blythe Solar Power Generation Station I	Blythe	Southwestern Solar Power	Approved	A planned 4.76 MW solar PV facility, including 69 PV panels that stand 50 feet tall and 72 feet wide	33
28	Point	Blythe Mesa Solar I	Blythe	Renewable Resources Group	Under review	A planned 485 MW solar PV project on private land in Blythe	33
1	Polygon	Rice Solar Energy Project	Rice Valley, Eastern Riverside County	Rice Solar Energy	Approved, construction date unknown at this time	150 MW solar power tower project with liquid salt storage. Project located on 1,410 acres and includes a power tower approximately 650 feet tall and 10 miles long interconnection with the WAPA Parker-Blythe transmission line	35
23	Point	Colorado River Substation Expansion	10 miles southwest of Blythe	SCE	Approved 7/2011	500/230kV substation, constructed in an area approximately 1000 ft by 1900 ft	36
22	Point	Twelve Residential Developments	Blythe	Various	Approved or under construction	12 residential development projects have been approved by the Blythe Planning Department: Vista Palo Verde, Van Weelden, Sonora South, Ranchette Estates, Irvine Assets, Chanslor Village, St. Joseph's Investments, Edgewater Lane, The Chanslor Place Phase IV, Cottonwood Meadows, Palo Verde Oasis. A total of 1,005 single family residences are proposed	36
26	Point	Four Commercial Projects	Blythe	Various	Approved	Four commercial projects have been approved by the Blythe Planning Department, including the Agate Road Boat & RV Storage, Riverway Ranch Specific Plan, Subway Restaurant and Motel, and Agate Senior Housing Development. Dates of construction are	36

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ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
						unknown at this time	
34	Point	Mount Signal Solar Farm #1	Calexico	82LV 8ME	EA pending	600 MW solar PV project located on 1,440 acres	51
33	Point	Travertine Point Specific Plan	St. Rte 86, between 81st Ave and Coolidge Spring Rd, Riverside and Imperial County	County of Riverside	Lead agency approved the project on 1/15/2013, and will have significant impacts	The project proposes the construction of a total of 16,665 residential units and 5,029,500 square feet of non-residential development. This includes approximately 1,410 acres of TMDCI lands of which 647 acres are in Imperial County.	52
33	Polygon	Ogilby Solar	Chocolate Mountain	Pacific Solar Investments	Revised POD 8/26/11	1,500 MW Solar Thermal Trough	53
4	Polygon	Quartzsite Solar Energy	10 miles north of Quartzsite	Solar Reserve	Draft EIS released	100MW, 653 foot tall power tower located on 1,500 acres of BLM land	57
21	Polygon	Nextlight Quartzsite	Quartzsite, AZ	Nextlight Renewable Power	Pending	50 MW CSP Trough	58
15	Point	East County Detention Center	Existing Riverside County Jail, Indio	Riverside County	EIR filed, review period ends	1,273 bed expansion of existing 353 bed detention center	58

Socioeconomics

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
					6/4/2013		
28	Polygon	La Posa Solar Thermal	Stone Cabin, AZ	Pacific Solar Investments	Pending	2,000 MW Solar	60
1	Point	La Paz Solar Tower	La Paz County, AZ	EnviroMission	Pre-construction	200 MW power station on 11.0 acres	61
30	Polygon	Wildcat Quartzsite	Quartzsite, AZ	Wildcat Quartzsite Solar	Pending	800 MW CSP Tower	62
14	Point	Hwy 111 Beautification and Improvement Project	Hwy 111, Riverside County	California State Transportation Commission	Lead agency approved the project on 3/5/2013, and will not have significant impacts	The project will widen Highway 111 from four to six lanes for a distance of approximately 4 miles	66
Fig 1B-1	Polygon	Imperial Solar Energy Center West	El Centro	CSOLAR Development	ROW granted	250 MW solar facility located on 65 acres of BLM land	73
Fig 1B-2	Polygon	Ocotillo Sol	9 miles southwest of El Centro	SDG&E	NOI published	18 MW project on 115 acres	74

ID	Feature	Project Name	Location	Ownership	Status	Project Description	Distance (MILE)
5	Point	College of the Desert West Valley Campus Facilities Master Plan & Phase I Project	Indian Canyon Drive and Tramview Road, Palm Springs	Desert Community College District	Draft EIR Submitted 3/15/2013	West Valley Campus Facilities Master Plan and Phase 1 Project. Total planned development of 650,000 sf on 119+ acres. Also includes 30 on-campus dwelling units and 10,000 sf of campus related retail. Phase 1 development of 50,000 sf.	77
Fig 1B-3	Polygon	Ocotillo Wind Energy Facility	5 miles west of Ocatillo	Ocotillo Express	ROW approved	115 MW wind facility located on 12,436 acres of BLM land	80

(Ex. 2000, p. 4.8-25 – 4.8-26)

## CUMULATIVE IMPACTS

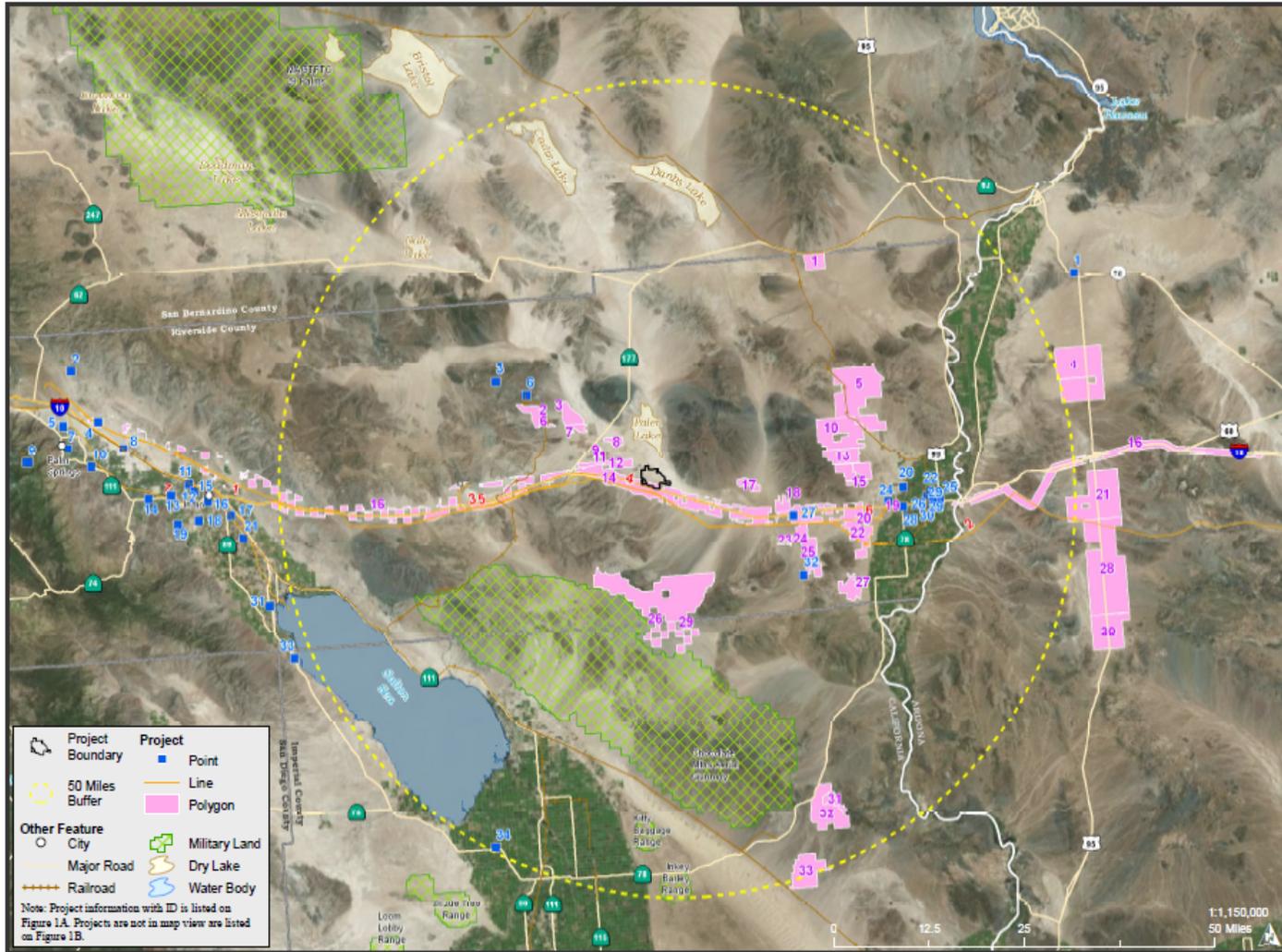
### Construction

Foreseeable development in the project area includes primarily renewable energy electrical generation and transmission infrastructure projects, with some residential and commercial development. Given the large number of renewable energy projects occurring within the PSEGS regional study area, it is possible that some overlap of construction phasing could occur between the PSEGS and the cumulative development projects. **Socioeconomics - Table 11a** presents the most recently published data (Year 2010–2020 projections) on labor force characteristics for the cumulative regional study area pertaining to solar energy project construction labor skill sets and compares those to major cumulative projects located near the PSEGS along the Interstate-10 corridor, including the Blythe Solar Power Project (BSPP), Genesis Solar Power Project (GSEP), Rice Solar Energy Project (RSEP), and the Desert Sunlight PV Project (DSPV). **Socioeconomics - Table 11b** presents a complete list of projects considered part of the socioeconomics cumulative analysis, including the map ID/feature that correlates with **Socioeconomics – Figure 3**, which shows the location of the projects. (Ex. 2000, p. 4.8-25.)

All cumulative projects identified in **Socioeconomics - Tables 11a** and **11b** would be expected to draw on the large regional construction workforce in and around Riverside/San Bernardino/Ontario MSA. **Socioeconomics - Table 11a** also identifies the labor force by skill for the MSA and the number of workers by skill to construct each project. Even in a worst-case scenario, should construction of these projects occur during overlapping peak work months, construction labor requirements would not exhaust the supply of construction labor by craft in the Riverside/San Bernardino/Ontario MSA. Other MSAs that could be a source of additional labor supply include the San Diego-Carlsbad-San Marcos MSA, El Centro MSA, and Santa Ana-Anaheim-Irvine Metropolitan Division. Based on the evidence, we conclude some of the construction workers will move from one project to another as each project is completed. This overlap could reduce the number of different construction workers seeking lodging closer to their project site. (Ex. 2000, p. 4.8-25.)

### Socioeconomics – Figure 3

Palen Solar Electric Generating System - FSA Cumulative Impacts



(Ex. 2000, Executive Summary Attachment A – Figure 1.)

Socioeconomics

7.3-45

While there is sufficient labor supply for the PSEGS and the other cumulative projects, the large number of construction workers needed for the projects when considered cumulatively, particularly if peak construction periods overlap, could impact the amount of hotel/motel and housing units in the local and regional study area. By itself, the PSEGS would not significantly impact the availability of local lodging supply. When considered cumulatively with the other projects, temporary lodging may be constrained in the local and regional study areas, thus contributing to a cumulative impact. As set forth above, construction workers prefer lodging with easy access to Interstate 10, dining options, and convenience stores. As more construction workers come to work on the various cumulative projects, lodging availability in the more ideally-located communities (e.g. Indio, Blythe, Ehrenberg), could be more difficult to find, necessitating construction workers to turn to less ideally-located communities. Less ideally-located communities include Mesa Verde, Desert Center, Ripley, Coachella, Bermuda Dunes, Thousand Palms, Thermal, Mecca, and Quartzsite. However, hotels and motels in these locations are either sparser (only one motel in Thousand Palms) or more expensive motels in Bermuda Dunes. Housing data for these communities is provided in **Socioeconomics - Tables 7a** and **7b**. Given these variables, more construction workers could choose to commute daily from their residence instead of moving closer to their job site. (Ex. 2000, p. 4.8-32.)

The evidence indicates that, when added with other projects with overlapping construction schedules, the PSEGS would contribute to a shortage of local and regional lodging. Approximately 1,005 single-family residential units are approved for construction in the City of Blythe and three residential developments are currently under construction. Riverside County approved a large residential development project with 16,665 units along the northwestern shores of Salton Sea (ID/feature 34/point). With these two projects, 17,670 residential units would be added to the PSEGS regional study area over time. The actual completion of construction of these projects is uncertain. However, we must assume that at least some of the units between the two projects will have completed construction during the PSEGS construction. Therefore, we find that no new housing would need to be created to meet the temporary lodging needs of the PSEGS and the other cumulative projects. (Ex. 2000, p. 4.8-32.)

Even with the temporary population increase in the local and regional study area, cumulative construction activities would not necessitate new or expanded public services (police, schools, parks and recreation) in the local study area based on information from the local BCTC and the Riverside County Sheriff's Department. The evidence suggests that construction workers for power plant projects tend to return to their residences on the weekend and, when at the project site, they work their hours and

go back to their temporary lodging in the evening. Further, there is a low probability that additional law enforcement services would be needed during the PSEGS construction and operation, so it is likely that with the addition of the other projects in the cumulative setting, additional law enforcement services would not be necessary. Construction workers do not tend to bring their families with them to their job site, so new or expanded schools are not anticipated for the PSEGS and the other projects in the cumulative setting. Therefore, we conclude that new or expanded parks and recreation services are not necessary for the PSEGS and other cumulative projects. Construction workers are not likely to spend much time visiting and using these resources. (Ex. 2000, pp. 4.8-32- 4.8-33.)

Short-term, construction-related spending activities of the PSEGS, as for the approved PSPP, are expected to have cumulative economic benefits for the study area (refer below to **Socioeconomics - Table 13**). The cumulative benefits would increase when revenues accrued as a result of the proposed PSEGS are combined with spending and any local revenues accrued as a result of current and future reasonably foreseeable cumulative development projects. (Ex. 2000, p. 4.8-33.)

### **Operation**

Operation of the PSEGS is expected to result in the potential permanent relocation of up to 25 workers into the local study area, versus 34 workers estimated for the approved PSPP. **Socioeconomics - Table 12** presents the most recently-published data (Years 2010–2020 projections) on labor force characteristics for the cumulative regional study area pertaining to solar energy project operational labor skill sets and compares those to major cumulative projects located near the PSEGS along the Interstate-10 corridor, including the GSEP, BSPP, RSEP, and the DSPV. (Ex. 2000, p. 4.8-33.)

**Socioeconomics - Table 12  
Cumulative Projects Operational Employment Needs and Labor Supply**

Trade	Total # of Workers for Project Operation						TOTAL	Riverside/San Bernardino/ Ontario MSA	
	<u>Approved PSPP Project</u>	<u>PSEGS</u>	<u>BSPP</u>	<u>GSEP</u>	<u>RSEP</u>	<u>DSPV</u>		2010	2020
<b>Solar Field and Power Block Workers</b>									
Operating Engineers and Other Construction Equipment Operators	—	24	—	—	—	—	24	2,510	3,030
<b>Technicians</b>									
Electrical and Electronics Repairers, Powerhouse, Substation and Relay	—	10	—	—	—	—	10	100	100
Control and Valve Installers and Repairers	—	2	—	—	—	—	2	620	680
Maintenance Workers, Machinery	—	4	—	—	—	—	4	610	660
<b>Operators</b>									
First-Line Operators	—	3	—	—	—	—	3	4,450	4,780
Power Plant Operators	—	12	—	—	—	—	12	130	150

<b>Warehouse and Maintenance Personnel</b>									
Janitors and Cleaners	—	1	—	—	—	—	1	17,120	19,110
Stock Clerks and Order Filler	—	2	—	—	—	—	2	22,090	25,720
Electrical and Electronics Repairers, Power house, Substation and Relay	—	2	—	—	—	—	2	100	120
Mobile Heavy Equipment Mechanics	—	4	—	—	—	—	4	1,680	1,790
Maintenance Workers, Machinery	—	4	—	—	—	—	4	610	660
<b>Administrative Personnel</b>									
General and Operation	—	1	—	—	—	—	1	16,920	18,030
Electrical Engineer	—	1	—	—	—	—	1	660	740
Mechanical Engineer	—	1	—	—	—	—	1	1,050	1,150
Secretaries and Administrative Assistants	—	2	—	—	—	—	2	12,670	13,420
Office and Administrative Support Workers	—	2	—	—	—	—	2	7,570	8,520
First-Line Supervisors of Mechanics, Installers, and Repairers	—	5	—	—	—	—	5	3,690	4,170
<b>Miscellaneous Support</b>									

Bus & Truck Mechanics and Diesel Engine Specialists	—	2	—	—	—	—	2	3,170	3,790
First-Line Supervisors of Mechanics, Installers, and Repairers	—	2	—	—	—	—	2	3,690	4,170
Electrical and Electronics Repairers, Power house, Substation & Relay	—	4	—	—	—	—	4	100	120
Control and Valve Installers and Repairers	—	2	—	—	—	—	2	620	680
Maintenance Workers, Machinery	—	2	—	—	—	—	2	610	660
Mobile Heavy Equipment Mechanics	—	2	—	—	—	—	2	1,680	1,790
Secretaries and Administrative Assistants	—	2	—	—	—	—	2	12,670	13,420
Office and Administrative Support Workers	—	2	—	—	—	—	2	7,570	8,520
Power Plant Operators	—	2	—	—	—	—	2	130	150
<b>Total</b>	<b>134</b>	<b>100</b>	<b>20</b>	<b>50</b>	<b>47</b>	<b>15</b>	<b>232<sup>2</sup></b>	<b>122,820</b>	<b>136,130</b>
<b>Local Housing Need<sup>1</sup></b>	<b>34</b>	<b>25</b>	<b>5</b>	<b>33</b>	<b>12</b>	<b>4</b>	<b>58</b>	<b>N/A</b>	<b>N/A</b>

Notes: — Data not available. N/A Not applicable.

<sup>1</sup> BSPP and PSEGS use a 25% relocation assumption in their respective AFCs. As no assumed percentage was included in the RSEP AFC or in the DSPV information provided by BLM, this table assumes 25% of operational employees would permanently relocate to the cumulative project area. The GSEP AFC specifically indicates that up to 33 workers would relocate. \*Total reflects the combined total peak month numbers for the PSEGS, BSPP, GSEP, RSEP, and DSPV projects.

Source: (Ex. 2000, pp. 4.8-34 – 4.8-35.)

**Socioeconomics - Tables 7a and 7b** show there is enough housing in the local study area to house the 25 operational workers estimated to relocate closer to the project and enough housing for the other operations workers for the cumulative projects. The combined 17,600 housing units in Blythe and near the northwestern end of the Salton Sea could also be a source of housing for the operations workers for the cumulative projects. Therefore, we find that there will be no housing supply shortage for the operations workers for the cumulative projects. The small increase in the overall PVUSD student body from the PSEGS would not pose a significant cumulative impact and when added to the other cumulative projects, it is not anticipated that the increased student enrollment would necessitate the provision of new or expanded school services. The Riverside County Sheriff's Department commented that there is a low probability that additional law enforcement services would be needed for project operations, so it is likely that with the addition of the other projects in the cumulative setting, new or expanded law enforcement services would not be necessary. The evidence shows that the addition of the 25 PSEGS operations workers in the local study area plus the operations workers for the other cumulative projects would not result in the need for new or expanded parks and recreation services, particularly when existing and planned housing (cumulative projects) would have considered these services. Also, operations workers for the PSEGS and the other cumulative projects may not all settle in the local study area, and instead may settle in the regional study area, especially as operations workers are known to commute up to an hour in each direction to work at a power plant. (Ex. 2000, p. 4.8-36.)

## **Closure**

The closure of the PSEGS is expected to result in similar cumulative impacts related to socioeconomics as PSEGS construction impacts, as described above. It is unknown if the construction or closure of any of the cumulative projects would occur concurrently with the closure of this project, because the closure is not expected to occur until at least 25 years from project start-up. Based on the cumulative impact analysis for PSEGS construction activities, the impacts of the closure of the PSEGS would not be expected to contribute to cumulative impacts related to socioeconomics. We find that

like the PSEGS, the non-operation and closure workforce would be drawn from the regional and local study areas, and at most, 15 percent of the workforce would temporarily relocate closer to the site for closure activities. (Ex. 2000, p. 4.8-36.)

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The relevant laws, ordinances, regulations, and standards (LORS) applicable to socioeconomics are contained in **Appendix A** of this decision.

Solar thermal projects are subject to property taxes, with calculation of those taxes based on California Revenue and Taxation Code section 73, if the project were under construction by January 1, 2017. However, the PSEGS is located entirely on the BLM lands. Under 43 United States Code, section 1701, the federal government is immune from state and local taxes so that no property taxes would be collected. The federal government can provide payments to compensate states and local governments for burdens created as a result of immunity (payment in lieu of taxes, or PILT) (43 U.S.C., § 1701 (a)(13)). (Ex. 2000, p. 4.8-36.) We conclude that the PSEGS project would comply with all applicable LORS regulating matters contained in the socioeconomics analysis.

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

### **BENEFITS**

For the purpose of this analysis, we define noteworthy public benefits to include changes in local economic activity and local tax revenue that would result from project construction and operation. Impact estimates reflect two different scenarios representing the construction and operation phases of the project. Economic impacts associated with the construction phase include substantial expenditures on materials and labor that would occur during the 33-month construction phase. (Ex. 2000, p. 4.8-37.)

The economic model most commonly used is the IMPLAN input-output model, developed by the Minnesota IMPLAN Group (MIG). The model relies on complex input-output tables and social accounting matrices. These are quantitative representations of the purchaser-supplier relationships between producers and intermediate and final consumers. Based on these tables, the analyst can estimate the economic activity that would result from a given expenditure, or other economic event. The resulting economic impact estimates are divided into three categories. These are the direct, indirect, and induced economic impacts. Within each of these categories, the model estimates associated changes in employment, labor income, and economic output.<sup>6</sup> Direct economic effects represent the employment, labor income, and spending associated with construction or operation of the project itself. Indirect economic effects represent the expenditures on intermediate goods made by suppliers who provide goods and services to the project. Induced economic effects represent household spending that occurs due to the increased wages, salaries, and proprietors' income generated in the direct and indirect rounds. (Ex. 2000, p. 4.8-37.)

**Socioeconomics - Table 13** provides a summary of economic and employment benefits of the PSEGS compared with the approved PSPP. As the PSEGS is completely on the BLM land and the federal government is immune from state and local taxes, property taxes would not be collected. However, through payment in lieu of taxes the federal government can provide payments to compensate state and local governments for burdens created as a result of immunity (43 U.S.C., § 1701, subd. (a)(13)). The petition to amend has identified that an estimated \$4.3 million in annual property tax would be assessed on the project if it were sited on non-BLM land. Payment in lieu of taxes would be at the discretion of the BLM. (Ex. 2000, p. 4.8-37.)

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<sup>6</sup> The Minnesota IMPLAN Group (2012) defines Economic Output as “the value of industry production.” In the manufacturing sector, output is equal to total sales, minus inventory changes. For the service sectors, output is equal to total sales. In the retail and wholesale trade sectors, output is equal to the gross margin (i.e., total sales, minus the cost of goods sold).

**Socioeconomics - Table 13  
PSEGS Economic Benefits**

<b>Fiscal Benefits</b>	<b>Approved PSPP Project (2009 dollars)</b>	<b>PSEGS</b>
Estimated annual property taxes	\$200,000 <sup>1</sup>	\$0 to 4.3 million <sup>2</sup>
State and local sales taxes: Construction	\$805,000	\$7 million
State and local sales taxes: Operation	\$437,500	\$70 million
School Impact Fee	\$0	Not applicable
<b>Non-Fiscal Benefits</b>		
Capital Cost	\$248,700,000	\$533.8 million <sup>3</sup>
Construction materials and supplies	\$30.0 million	\$71,400,000
Operations and maintenance supplies	\$5.0 million	\$589,600
<b>Direct, Indirect, and Induced Benefits</b>		
<b><i>Estimated Direct Employment</i></b>		
Construction	566 jobs (annual full-time equivalent over full 39-month construction phase)	840 jobs
Income	\$218.7 million (total over full 39-month construction phase)	\$462.4 million
Operation	134 jobs	100 jobs
Income	\$5.8 million (annual)	12.3 million (annual)
<b><i>Estimated Indirect Employment</i></b>		
Construction	291 jobs	172 jobs

Income	\$14.0 million	\$11 million
Operation	40 jobs	8 jobs
Income	\$3.0 million	\$36,605
<b><i>Estimated Induced Employment</i></b>		
Construction	196 jobs	3,274 jobs
Income	\$13.0 million	\$159.1 million
Operation	37 jobs	69 jobs
Income	\$2.0 million	\$2,778,257

NOTES:

1 AT PRESENT, THERE IS NO PROPERTY TAX ASSESSED ON SOLAR COMPONENTS (MIRRORS, SOLAR BOILER, HEAT EXCHANGERS) BY LAW (SECTION 73 OF THE CALIFORNIA TAXATION AND REVENUE CODE). COMPONENTS INCLUDED UNDER THE EXEMPTION INCLUDE STORAGE DEVICES, POWER CONDITIONING EQUIPMENT, TRANSFER EQUIPMENT, AND PARTS. THE FIRST OPERATIONAL YEAR AND SUBSEQUENTLY THEREAFTER WOULD GENERATE AN ESTIMATED \$200,000 IN ANNUAL PROPERTY TAXES.

2 AS THE PSEGS IS COMPLETELY ON THE BLM LAND AND THE FEDERAL GOVERNMENT IS IMMUNE FROM STATE AND LOCAL TAXES, PROPERTY TAXES WOULD NOT BE COLLECTED. HOWEVER, THE FEDERAL GOVERNMENT CAN PROVIDE PAYMENTS TO COMPENSATE STATES AND LOCAL GOVERNMENTS FOR BURDENS CREATED AS A RESULT OF IMMUNITY (43 U.S.C., § 1701, SUBD. (A)(13)). AN ESTIMATED \$4.3 MILLION WOULD ORDINARILY BE ASSESSED WHICH THE FEDERAL GOVERNMENT COULD PAY TO RIVERSIDE COUNTY, EITHER IN FULL, IN PART, OR NOT AT ALL.

3 THE APPLICANT ESTIMATED THE CAPITAL COST FOR CONSTRUCTION AS \$2 MILLION. STAFF QUESTIONS THE APPLICANT'S ESTIMATE AS THE COMBINED ESTIMATE FOR LOCAL MATERIALS AND SUPPLY PURCHASES AND THE TOTAL CONSTRUCTION PAYROLL (CAPITAL COSTS) ADD UP TO \$533.8 MILLION.

Source: (Ex. 2000, p. 4.8-38.)

## PUBLIC COMMENT

The following comments were received from the public regarding socioeconomics:

In its October 29, 2013 letter, the **County of Riverside** questioned the information contained in Table 14 of the FSA's **SOCIOECONOMICS** section and asked that the expected state and local sales tax amounts be clarified.

On November 25, 2013, **Paul Smith** submitted a letter from Tourism Economics Commission stating that there is insufficient discussion of the effect of PSEGS on National Parks and related businesses and local governments that are dependent on tourism.

On July 23, 2014, **Larry McLaughlin**, from Inland Empire/Desert Region Community Colleges commented in support of the jobs that will be created by the Palen central receiver solar project and to express a willingness to support the ensuing employment process through area workforce training. These utility-scale solar projects are important for the economy and for mitigating serious environmental impacts from climate warming. The region's community colleges stand ready to assist with the industry's workforce development needs.

**David Vasquez, Mike Dea, Andy Schultz, Frank Beals, Gabriel Villareal, Robert Frost, James Schlueter Kathy Snow, and Glen Cross** all spoke in support of the project at the July 30, 2014 evidentiary hearing. All of these commenters said that the PSEGS project would provide much needed jobs to the Blythe area and Coachella Valley and it would help the economy in general. Some of them had worked on Genesis. Others described the benefits of the Labor Unions' apprenticeship programs and the Helmets to Hardhats program to enable veterans to obtain good paying, long-term careers in construction.

These concerns are all addressed above, in the **SOCIOECONOMICS** section of this Decision.

#### **FINDINGS OF FACT**

1. A large labor pool residing in the Riverside/San Bernardino/Ontario Metropolitan Statistical Area (MSA) would be available within a two-hour commuting distance for construction and operation of the project.
2. Over the 33-month construction period, an average of approximately 1,166 daily construction workers, with a peak daily workforce of 2,311, would be required depending on the month and phase of development.
3. The project would hire about 100 permanent, full-time employees from the Riverside/San Bernardino/Ontario MSA for project operations.
4. The project would not cause an influx of a significant number of construction or operation workers to permanently relocate to the local area.
5. There would be an adequate supply of hotels/motels and rental properties within the project vicinity to accommodate workers who stay in the area temporarily during the week and commute to their homes on the weekend.
6. The project would not result in significant adverse effects on local employment, housing, schools, public utilities, parks and recreation, law enforcement, or emergency services.

7. The anticipated construction payrolls, the local purchases of materials and supplies, and the sales tax revenues generated by the expenditures would have a beneficial effect on the local and regional economy.
8. The anticipated annual operations payroll, annual local capital expenditures and materials, and indirect economic effects would have a beneficial effect on the local and regional economy.
9. The PSEGS is completely on the BLM land and the federal government is immune from state and local taxes and property taxes would not be collected.
10. The project is exempt from paying the statutory school development fee because the industrial construction that would be subject to the fee is located on federal property.
11. The project would provide direct, indirect, and induced economic benefits to Riverside County and surrounding communities.
12. The project would not create disproportionate impacts on minority and/or low-income populations because there are no environmental justice populations within six miles of the project site.
13. PSEGS impacts to cultural resources disproportionately affect indigenous peoples.
14. Construction and operation of the project would not result in any direct, indirect, or cumulative significant adverse socioeconomic impacts.
15. As we found in ALTERNATIVES, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. We, therefore, conclude that implementation of all conditions of certification in this decision ensures that the project would comply with all applicable LORS relating to socioeconomic factors as identified in the pertinent portions of **Appendix - A**.
2. The record contains an adequate analysis of socioeconomic effects related to the project and establishes that the project would not create any significant adverse socioeconomic effects as defined under the National Environmental Policy Act or the California Environmental Quality Act.
3. The evidence of record contains an adequate analysis of potential socioeconomic effects in accordance with federal and state guidelines on

environmental justice and establishes that the project would not create any disproportionate adverse effects on minority or low-income populations.

**CONDITIONS OF CERTIFICATION**

**SOCIO-1** The project owner shall submit a “No Trespassing” letter to the satisfaction of the Colorado River Station of the Riverside County Sheriff’s Department. The “No Trespassing” letter shall remain on file throughout construction and operation of the project.

**VERIFICATION:** At least 30 days prior to the start of construction, the project owner shall provide a copy of the letter to the Colorado River Station of the Riverside County Sheriff’s Department for review and to the CPM for review and approval.

## **D. NOISE AND VIBRATION**

### **DESCRIPTION OF MODIFICATIONS**

The modifications proposed in the Palen Solar Electric Generating System (PSEGS) petition include replacing the parabolic trough solar collection system, steam turbine generator, and associated heat transfer fluid with BrightSource's solar tower technology. Heliostats (elevated mirrors guided by a tracking system mounted on a pylon) focus the sun's rays on a solar receiver steam generator (SRSG) located atop a 750-foot-tall tower near the center of each solar field to create steam to drive a turbine that generates electricity. The PSEGS two power blocks are similar to the Palen Solar Power Plant (PSPP) in size and types of equipment. However, the location of the PSEGS power block relative to the closest sensitive receptor is farther away from the sensitive receptor than the location of the closest PSPP power block. (Ex. 2000, p. 4.6-5.)

The following evidence on noise and vibration was received into evidence on October 29, 2013: Exhibits 1003, 1044, 1076, 2000, and 2008. (10/29/13 RT 40:10 – 40:24.)

### **THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION**

The final Energy Commission Decision certifying the PSPP found that with the implementation of the conditions of certification, the project will not cause significant indirect, direct, or cumulative adverse noise impacts. The Decision found that the nearest sensitive noise receptors were individual residences located about 25 feet and 3,500 feet (LT 1 and LT 2, respectively) from the project's northwest border. The Decision recognized that PSPP construction will increase noise levels at the nearest sensitive receptors, but found that construction noise levels are temporary and transitory in nature and will be mitigated to the extent feasible by sound reduction devices, limiting construction to daytime hours, and establishing a complaint process for the public. The Decision found that operation and construction noise increases are below a level of significance. (PSPP Final Decision, CEC-800-2010-011, **NOISE AND VIBRATION**, pp. 5-6.)

### **THE AMENDED PROJECT'S IMPACTS AND MITIGATION**

#### **Construction Impacts and Mitigation**

Construction noise is usually a temporary phenomenon. Construction of the PSEGS project is expected to be typical of similar projects in terms of equipment used and other types of activities. (Exs. 1003, p. 6.4.2; 2000, p. 4.6-7.)

The evidence indicates that construction noise from the PSEGS project is expected to be the same as the PSPP project. The evidence shows that there are no new pieces of

equipment or methods of construction that were not analyzed previously for the approved project. (Ex. 2000, p. 4.6-7.)

The project owner must perform noisy construction work during the times specified in the Riverside County Noise Ordinance between the hours of 6:00 a.m. to 7:00 p.m. Monday through Friday from June through September, and between 6:00 a.m. to 6:00 p.m. Monday through Friday from October through May. Construction will take place from 9:00 a.m. to 5:00 p.m. on Saturdays with no construction allowed on Sundays and Federal holidays. (Palen 2012a, § 6.4.3.) Condition of Certification **NOISE-6** ensures that these hours are enforced. Noise impacts of the PSEGS project construction activities would comply with the noise laws, ordinances, regulations and standards (LORS). (Ex. 2000, p. 4.6-8.)

Even though project construction would likely last 33 months, the construction activities within an area that would potentially considerably impact the nearest residential receptor would not last more than several months. The nearest location to the nearest residence (LT1) where there would be more than minimal activities is the northwestern extent of the solar arrays of Unit #2 near the residence. The evidence shows that construction noise from site grading and array installation would not exceed 59 dBA  $L_{eq}$  at the nearest residence (LT1), temporarily resulting in a 16 dBA increase in the ambient noise level at LT1; this is a considerable increase. However, this impact would be only for the short time that construction activities would occur in that portion of the site. Noise levels would decrease the farther away construction activities would occur from the residence. (Ex. 2000, p. 4.6-8.)

The second nearest residence (LT2) is also located northwest of the project site, but it is further away from the site than LT1. The above activities in the northwestern extent of the solar arrays of Unit #2 would likely generate a noise level of 46 dBA  $L_{eq}$  at the LT2. This would result in a temporary increase in the ambient noise level at LT2 of 5. The record establishes that an increase of 5 dBA would be less than significant. (Ex. 2000, p. 4.6-8.)

Therefore, because of the temporary nature of these activities and because construction would be limited to the daytime hours, we find the noise effects of plant construction would be considered less than significant at the above receptors. (Ex. 2000, p. 4.6-8.)

To ensure the project construction would create less-than-significant adverse impacts at the most noise-sensitive receptors, in addition to Condition of Certification **NOISE-6**, we impose Conditions of Certification **NOISE-1** and **NOISE-2**, which establish a public notification and noise complaint process to resolve any complaints regarding construction noise. (Ex. 2000, p. 4.6-9.)

In light of the following conditions of certification, we find noise impacts of the PSEGS project construction activities would be less than significant.

### **Steam Blows**

Typically, the loudest noise encountered during construction, inherent in building any project incorporating a steam turbine, is created by the steam blows. After erection and assembly of the feed water and steam systems, the piping and tubing that comprise the steam path have accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine quickly destroying the machine. (Ex. 2000, p. 4.6-9.)

In order to prevent this, before the steam system is connected to the turbine, the steam line is temporarily routed to the atmosphere. Traditionally, high pressure steam is then raised in the boiler or a temporary boiler and allowed to escape into the atmosphere through the steam piping. This flushing action, referred to as a *high pressure steam blow*, is quite effective at cleaning out the steam system. A series of short steam blows lasting two or three minutes each are performed several times daily over a period of two or three weeks. At the end of this procedure, the steam lines are connected to the steam turbine, which is then ready for operation. Alternatively, high-pressure compressed air can be substituted for steam. (Ex. 2000, p. 4.6-9.)

High-pressure steam blows, if unsilenced, can typically produce noise levels as high as 129 dBA at a distance of 50 feet; this would amount to roughly 88 dBA at LT1 and 84 at LT2. Unsilenced steam blows could be disturbing at the nearest noise-sensitive receptors depending on the frequency, duration, and noise intensity of venting. With a silencer installed on the steam blow piping, noise levels are commonly attenuated to 89 dBA at 50 feet. (Ex. 2000, p. 4.6-9.)

To minimize the impact of steam blows, Condition of Certification **NOISE-7**, limits steam blow noise to 89 dBA, measured at a distance of 100 feet. A noise level of 89 dBA at 100 feet results in about 53 dBA at LT1, which is tolerable. This condition of certification also limits steam blows to between 8:00 a.m. and 5:00 p.m. (Ex. 2000, p. 4.6-9.)

### **Linear Facilities, Vibration and Worker Safety**

Construction of linear facilities typically moves along at a rapid pace, thus not subjecting any one receptor to noise impacts for more than two or three days. Further, construction activities are limited to daytime hours. Condition of Certification **NOISE-6** ensures that these hours are, in fact, adhered to in compliance with the LORS Staff proposes. (Ex. 2000, p. 4.6-10.)

There would be no vibration impacts because the PSEGS requires no pile driving during construction. (Ex. 2000, p. 4.6-10.)

The project owner has acknowledged the need to protect construction workers from noise hazards and has recognized applicable LORS that would protect construction workers (Solar Millennium 2009a, AFC §§ 5.8.1, 5.8.4). Condition of Certification **NOISE-3** ensures that construction workers would be, in fact, adequately protected. (Ex. 2000, p. 4.6-10.)

### **Operational Impacts and Mitigation**

The primary noise source of the PSEGS plants will be the power blocks where the steam turbine generators, the air-cooled condensers, electric transformers, and various pumps and fans would be located. The PSEGS project's major noise sources are similar to those for the PSPP and, thus, the noise modeling used for the approved PSPP project is still applicable. The project's two power blocks (one for each 250 MW unit) will be centrally located in the middle of each solar unit; these blocks would be surrounded by the solar reflector fields. The overall noise generated by these various noise sources will be based on the configuration of the sources, the number and power rating of the equipment, and any noise-reducing measures incorporated. (Ex. 2000, p. 4.6-10.)

The project will avoid the creation of annoying tonal (pure-tone) noises by balancing the noise emissions of various power plant features during plant design (Condition of Certification **NOISE-4**). (Ex. 2000, p. 4.6-10.)

For the PSPP project, the project owner performed noise modeling to determine the project's noise impacts on sensitive receptors (Solar Millennium 2009a, AFC § 5.8.3.3). Based on that modeling, the project owner predicted the operational noise levels at the nearest sensitive receptors; they are shown in **Noise - Table 1** below. As explained above, the PSEGS project's major noise sources would be similar to those for the approved project and, thus, the noise modeling used for the PSPP is still applicable. (Ex. 2000, p. 4.6-10.)

The Noise Ordinance allows for different levels of acceptable noise depending upon land use. Section 4 of Ordinance No. 847 (Regulating Noise) limits noise on any property that causes the exterior noise level on any other occupied property to 55 dBA during the daytime hours and 45 dBA during the nighttime hours for noise-sensitive receptors within a very low density rural area, such as the area surrounding the project site. The project owner predicts the project's operational noise level at receptor LT1, the nearest receptor, to be 42 dBA  $L_{eq}$  (Solar Millennium 2009a, AFC § 5.8.3.3). This level would be less than the above LORS requirements. (Ex. 2000, p. 4.6-11.)

The predicted operational noise level also complies with Riverside County’s guideline that considers a noise level of up to 60 dBA day/night average (Ldn) or CNEL (Community Noise Equivalent Level) to be normally acceptable. (Ex. 2000, p. 4.6-11.)

Condition of Certification **NOISE-4** sets the daytime average noise limit at 48 dBA  $L_{eq}$  measured at or near monitoring location LT1 and requires a noise survey as the plant becomes operational. Conditions of Certification **NOISE-1** and **NOISE-2**, which establish a public notification and noise complaint process, require the project owner to resolve any problems caused by operational noise. (Ex. 2000, p. 4.6-11.)

With the implementation of these conditions of certification, noise due to the operation of the PSEGS project will be in compliance with applicable LORS.

As explained, the PSEGS project will operate during the daylight hours. Thus, the record compares the project’s noise levels to the existing daytime ambient noise levels at the project’s noise-sensitive receptor. (Please see below for limited nighttime activities.) (Ex. 2000, p. 4.6-11.)

Typically, daytime ambient noise consists of both intermittent and constant noises. The noise that stands out during this time is therefore best represented by the average noise level referred to as  $L_{eq}$ . The evaluation of the above noise surveys shows that the daytime noise environment in the project area consists of both intermittent and constant noises. Thus, the evidence compares the project’s noise levels to the daytime ambient  $L_{eq}$  levels at the project’s noise-sensitive receptors. (Ex. 2000, p. 4.6-11.)

The project owner has predicted the operational noise level at LT1; it is shown here in **Noise - Table 1**.

**Noise - Table 1**  
**Predicted Operational Noise Levels at the Identified Sensitive Residential Receptors**

Receptor	Project Alone Operational Noise Level  (dBA)	Measured Existing Ambient, Daytime $L_{eq}$  (dBA)	Cumulative  $L_{eq}$  (dBA)	Increase in Existing Ambient  (dBA)
LT1	42	43	46	+3
LT2	33 <sup>3</sup>	43	43	0

Source: (Ex. 2000, p. 4.6-11.)

Combining the ambient noise level of 43 dBA  $L_{eq}$  (**Noise - Table 1** above) with the project noise level of 42 dBA at LT1, will result in 46 dBA  $L_{eq}$ , 3 dBA above the ambient. As described above, an increase of up to 5 dBA is a less-than-significant impact. Therefore, we find the noise impact at LT1 to be less than significant. (Ex. 2000, p. 4.6-12.)

Combining the ambient noise level of 43 dBA  $L_{eq}$  (**Noise - Table 1** above) with the project noise level of 33 dBA at LT2 results in 43 dBA  $L_{eq}$ . The project would not cause an increase in the ambient noise level. Therefore, there would be no impact at the LT2 location. (Ex. 2000, p. 4.6-12.)

Adverse impacts on residential receptors can also be identified by comparing predicted power plant noise levels with the nighttime ambient background noise levels at the nearest sensitive residential receptors. The PSEGS project would have limited nighttime activities related to maintenance. The project owner's projection of the noise level from these activities at LT1 is 22 dBA. This is significantly lower than the average nighttime ambient noise level of 34 at LT1, thus the project's nighttime activities would have a less-than-significant impact on the project's most noise-sensitive receptor. Subsequently, operational activities would have no impact on LT2, since it is at an even greater distance from the project site than LT1. (Ex. 2000, p. 4.6-12.)

We impose Condition of Certification **NOISE-4** to ensure that the noise level due to project operation would not exceed the levels indicated in **Noise - Table 1**, second column. (Ex. 2000, p. 4.6-12.)

One possible source of annoyance could be strong tonal noises. Tonal noises are individual sounds (such as pure tones) which, while not louder than permissible levels, stand out in sound quality. To ensure that tonal noises do not cause public annoyance, Staff proposes Condition of Certification **NOISE-4**, which would require mitigation measures, if necessary, to ensure the project would not create tonal noises. (Ex. 2000, p. 4.6-12.)

### **Linear Facilities, Vibration and Worker Safety**

All water pipes and gas pipes will be underground and, therefore, silent during plant operation. Noise effects from electrical interconnection lines typically do not extend beyond the lines' right-of-way easements and will be inaudible to receptors. (Ex. 2000, p. 4.6-12.)

Vibration from an operating power plant could be transmitted through two primary means: ground (ground-borne vibration) and air (airborne vibration). (Ex. 2000, p. 4.6-12.)

The operating components of the PSEGS plant consist of high-speed steam turbine generators and various pumps and fans. All of these pieces of equipment will be carefully balanced in order to operate. Permanent vibration sensors will be attached to the turbines and generators. Based on experience with numerous previous projects employing similar equipment, the evidence shows that ground-borne vibration from the PSEGS project would be undetectable by any likely receptor. (Ex. 2000, p. 4.6-12.)

Airborne vibration (low frequency noise) can rattle windows, objects on shelves, and the walls of lightweight structures. However, none of the project equipment is likely to produce noticeable low frequency noise beyond the project site boundaries. The evidence indicates that the PSEGS would not cause perceptible airborne vibration effects at any off-site noise-sensitive receptor. (Ex. 2000, p. 4.6-13.)

The project owner acknowledges the need to protect plant operating and maintenance workers from noise hazards and commits to compliance with all applicable LORS. Signs shall be posted in areas of the plant with noise levels exceeding 85 dBA (the level that OSHA recognizes as a threat to workers' hearing), and hearing protection will be required and provided. To ensure that plant operation and maintenance workers are adequately protected, we impose Condition of Certification **NOISE-5**, which requires an occupational noise survey. For further discussion of proposed worker safety conditions of certification, please see the **WORKER SAFETY AND FIRE PROTECTION** section of this decision. (Ex. 2000, p. 4.6-13.)

### **Facility Closure Impacts and Mitigation**

The evidence shows that operational noise would cease when the PSEGS closes. The noise associated with dismantling the project would be mitigated in the same way the construction noise emissions would be mitigated. (Ex. 2000, p. 4.6-13.)

### **CUMULATIVE IMPACTS**

The **PROJECT DESCRIPTION** section of this decision provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario that forms the basis of the cumulative impact analysis for the proposed modified project. (Ex. 2000, p. 4.6-13.)

The record establishes that since the PSPP project was approved, there are no new projects or new "reasonably foreseeable probable future projects" within a distance that would cause cumulative noise and vibration impacts when combined with the PSEGS project. Furthermore, the change in technology (from parabolic through to solar tower) would not result in cumulatively considerable noise impacts that were not analyzed in the PSPP decision. We find that the PSEGS amendment would not result in a significant cumulative impact. (Ex. 2000, p. 4.6-13.)

We find that the PSEGS project, if built and operated in conformance with the existing conditions of certification, would comply with all applicable noise and vibration LORS and would produce no significant direct, indirect, or cumulative noise impacts on people within the project area.

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The LORS applicable to hazardous materials management are contained in **APPENDIX A** of this Decision. We conclude that the PSEGS project would comply with all applicable LORS regulating project noise and vibration.

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Petitioner, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be true (see the **PROJECT DESCRIPTION** section of this decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

### **BENEFITS**

Throughout this decision we describe various benefits that would accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. The location of the PSEGS power block relative to the closest sensitive receptor is farther away from the sensitive receptor than the location where the closest PSPP power block would have been.

### **PUBLIC COMMENT**

There were no comments received from the public regarding the noise and vibration.

### **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. Construction noise from the PSEGS project would be about the same level as the PSPP.
2. PSEGS construction activities would be temporary and limited to daytime hours.

3. The noise impacts of the PSEGS plant construction would be less than significant.
4. Although project construction will last 33 months, the construction activities within an area that could considerably impact the nearest residential receptor would not last more than several months.
5. Condition of Certification **NOISE-7**, which limits the momentary steam blow noise to 89 dBA measured at a distance of 100 feet, results in about 53 dBA at LT1, which would be tolerable.
6. The noise impacts from construction of linear facilities at PSEGS would be less than significant.
7. The PSEGS plant construction would not include pile driving.
8. Conditions of certification and adherence to LORS ensure that workers at the PSEGS facility would be adequately protected from construction and operational noise impacts.
9. The PSEGS project's operational noise level at the nearest receptor would be 42 dBA Leq., which is less than the LORS requirements.
10. The operational noise level of the project would be 3 dBA above the ambient at the nearest receptor.
11. Daytime and nighttime operational noise impacts at nearby receptors would be less than significant.
12. Conditions of certification institute a public notification and noise complaint process.
13. The PSEGS noise, in combination with other projects in the vicinity of the project, would not be cumulatively considerable.
14. PSEGS would be designed for an operating life of 25 to 30 years.
15. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. PSEGS will comply with all applicable noise and vibration LORS and would produce no significant direct, indirect, or cumulative noise impacts on people within the project area.

2. The PSEGS project would comply with all applicable LORS regulating project noise and vibration.
3. The change in the project would be beneficial to the public, Petitioner, and Intervenor, by locating the power block farther away from the sensitive receptor than the nearest PSPP power block would have been.
4. There has been a substantial change in circumstances since the original approval, because, at the time of the original licensing, the project was wholly owned by Solar. Millennium. PSH did not acquire the project site until after the Commission's Final Decision on PSPP.

### **CONDITIONS OF CERTIFICATION**

All the **NOISE AND VIBRATION** conditions of certification remain unchanged.

### **PUBLIC NOTIFICATION PROCESS**

**NOISE-1** At least 15 days prior to the start of ground disturbance, the project owner shall notify all residents within one mile of the project site and the linear facilities, by mail or by other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours a day, the project owner shall include an automatic answering feature with date and time stamp recording to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction where it is visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.

**VERIFICATION:** Prior to ground disturbance, the project owner shall transmit to the compliance project manager (CPM) a statement signed by the project owner's project manager stating that the above notification has been performed and describing the method of that notification. This communication shall also verify that the telephone number has been established and posted at the site and shall provide that telephone number.

### **NOISE COMPLAINT PROCESS**

**NOISE-2** Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project-related noise complaints. The project owner or authorized agent shall:

1. Use the Noise Complaint Resolution Form (below), or a functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. Attempt to contact the person(s) making the noise complaint within 24 hours;
3. Conduct an investigation to determine the source of noise in the complaint;
4. If the noise is project related, take all feasible measures to reduce the source of the noise; and
5. Submit a report documenting the complaint and actions taken. The report shall include a complaint summary including the final results of noise reduction efforts and, if obtainable, a signed statement by the complainant stating that the noise problem has been resolved to the complainant's satisfaction.

**VERIFICATION:** Within 5 days of receiving a noise complaint, the project owner shall file a Noise Complaint Resolution Form (below) with both the local jurisdiction and the CPM that documents the resolution of the complaint. If mitigation is required to resolve the complaint and the complaint is not resolved within a 3-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is performed and complete.

### **EMPLOYEE NOISE CONTROL PROGRAM**

**NOISE-3** The project owner shall submit to the CPM, for review and approval, a noise control program. The noise control program shall be used to reduce employee exposure to high (above permissible) noise levels during construction in accordance to the applicable OSHA and Cal-OSHA standards.

**VERIFICATION:** At least 30 days prior to the start of ground disturbance, the project owner shall submit the noise control program to the CPM. The project owner shall make the program available to Cal-OSHA upon request.

### **NOISE RESTRICTIONS**

**NOISE-4** The project design and implementation shall include appropriate noise mitigation measures adequate to ensure that the operation of the project will not cause the noise levels, due to plant operation alone during the daytime hours of 7 a.m. to 10 p.m., to exceed an average of 48 dBA  $L_{eq}$  measured at or near monitoring location LT1.

No new pure-tone components shall be caused by the project. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints<sup>1</sup>.

A. When the project first achieves a sustained output of 85 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey at monitoring location LT1, or at a closer location acceptable to the CPM. This survey shall also include measurement of one-third octave band sound pressure levels to ensure that no new pure-tone noise components have been caused by the project.

The measurement of power plant noise, for the purposes of demonstrating compliance with this condition of certification, may alternatively be made at a location acceptable to the CPM closer to the plant (e.g., 400 feet from the plant boundary), and this measured level then mathematically extrapolated to determine the plant noise contribution at the affected residence. The character of the plant noise shall be evaluated at the affected receptor locations to determine the presence of pure tones or other dominant sources of plant noise.

B. If the results from the noise survey indicate that the power plant noise at the affected receptor site exceeds the above value during the above time period, mitigation measures shall be implemented to reduce noise to a level of compliance with this limit.

C. If the results from the noise survey indicate that pure tones are present, mitigation measures shall be implemented to eliminate the pure tones.

**VERIFICATION:** The survey shall take place within 30 days of the project first achieving a sustained output of 85 percent or greater of rated capacity. Within 15 days after completing the survey, the project owner shall submit a summary report of the survey to the CPM. Included in the survey report shall be a description of any additional mitigation measures necessary to achieve compliance with the above-listed noise limit and a schedule, subject to CPM approval, for implementing these measures. When these measures are in place, the project owner shall repeat the noise survey.

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<sup>1</sup> A legitimate complaint refers to a complaint about noise that is caused by the PSEGS project as opposed to another source (as verified by the CPM). A legitimate complaint constitutes a violation by the project of any noise condition of certification (as confirmed by the CPM), which is documented by an individual or entity affected by such noise.

Within 15 days of completion of the new survey, the project owner shall submit to the CPM a summary report of the new noise survey, performed as described above and showing compliance with this condition.

## **OCCUPATIONAL NOISE SURVEY**

**NOISE-5** Following the project's attainment of a sustained output of 85 percent or greater of its rated capacity, the project owner shall conduct an occupational noise survey to identify any noise hazardous areas in the facility.

The survey shall be conducted by a qualified person in accordance with the provisions of California Code of Regulations, title 8, sections 5095-5099 (art. 105), and Code of Federal Regulations, title 29, section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure.

The project owner shall prepare a report of the survey results and, if necessary, identify mitigation measures to be employed in order to comply with the applicable California and federal regulations.

**VERIFICATION:** Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA and Cal-OSHA upon request.

## **CONSTRUCTION RESTRICTIONS**

**NOISE-6** Heavy equipment operation and noisy construction work relating to any project features within one-quarter of a mile of an existing residence shall be restricted to the times delineated below, unless a special permit has been issued by the County of Riverside:

Mondays through Fridays:

June through September: 6 a.m. to 7 p.m.

October through May: 6 a.m. to 6 p.m.

Saturdays: 9 a.m. to 5 p.m.

Sundays and Federal Holidays: No Construction Allowed

Haul trucks and other engine-powered equipment shall be equipped with adequate mufflers. Haul trucks shall be operated in accordance with posted speed limits. Truck engine exhaust brake use shall be limited to emergencies.

**VERIFICATION:** Prior to ground disturbance, the project owner shall transmit to the CPM a statement acknowledging that the above restrictions will be observed throughout the construction of the project.

**NOISE-7** If a traditional high-pressure steam blow process is used, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 89 dBA measured at a distance of 100 feet. The steam blows shall be conducted between 8:00 a.m. and 5:00 p.m., unless arranged with the CPM, such that off-site impacts will not cause annoyance to receptors. If a low-pressure continuous steam-blow process is used, the project owner shall submit to the CPM a description of the process with expected noise levels and planned hours of steam blow operation.

**VERIFICATION:** At least 15 days prior to the first steam blow, the project owner shall notify all residents or business owners within one mile of the project site boundary. The notification may be in the form of letters, phone calls, fliers, or other effective means as approved by the CPM. The notification shall include a description of the purpose and nature of the steam blow(s), the planned schedule, expected sound levels, and explanation that it is a one-time activity and not part of normal plant operation.

**EXHIBIT 1 - NOISE COMPLAINT RESOLUTION FORM**

Palen Solar Power Project (09-AFC-7)	
<b>NOISE COMPLAINT LOG NUMBER</b> _____	
Complainant's name and address:	
Phone number: _____	
Date complaint received: _____ Time complaint received: _____	
Nature of noise complaint:	
Definition of problem after investigation by plant personnel:	
Date complainant first contacted:	
Initial noise levels at 3 feet from noise source _____ dBA	Date: _____
Initial noise levels at complainant's property: _____ dBA	Date: _____
Final noise levels at 3 feet from noise source: _____ dBA	Date: _____
Final noise levels at complainant's property: _____ dBA	Date: _____
Description of corrective measures taken:	
Complainant's signature: _____	Date: _____
Approximate installed cost of corrective measures: \$ _____	
Date installation completed: _____	
Date first letter sent to complainant: _____ (copy attached)	
Date final letter sent to complainant: _____ (copy attached)	
This information is certified to be correct:	
Plant Manager's Signature: _____	

(Attach additional pages and supporting documentation, as required.)

## E. VISUAL RESOURCES

### DESCRIPTION OF MODIFICATIONS

The amended project Palen Solar Electric Generating System (PSEGS) will occupy the same location as the certified project Palen Solar Power Plant (PSPP), but reduces the project footprint from approximately 4,366 acres to approximately 3,794 acres. The PSEGS is 572 acres smaller than the PSPP. Much of the developed area will be covered with the arrays of heliostats (elevated mirrors) which collect heat energy from the sun. Like the PSPP, the PSEGS' mirror fields would be relatively low in height (under 20 feet maximum height). The amended PSEGS project includes two 750-foot-tall solar towers topped by 130-foot-tall solar receivers (SRSGs) that are the focal point of the concentrated sunlight reflected by the heliostats. The SRSGs absorb the concentrated sunlight to create steam, but also reflect sunlight outwardly. The super-heated SRSGs would act as extremely bright sources of light. Similar to the PSPP, the PSEGS project also includes various power-generation structures and a power transmission line from the project site extending westward to the Red Bluff substation under construction south of Interstate 10 (I-10) between the project site and Desert Center. The most prominent public views of the transmission line would be from I-10 immediately to the south and State Highway 177 (SR 177) roughly nine miles to the west. The project's transmission line route traverses Colorado Desert Creosote Bush Scrub community shrubs and grasses. **Visual Resources - Table 1** provides a list of the major project features that would contribute to the apparent visual change of the landscape. A more detailed discussion of the PSEGS project is presented in the **PROJECT DESCRIPTION** section of this Decision. In addition to the features listed in **Table 1** below, the PSEGS project requires the installation of chain link fencing and desert tortoise fencing around the perimeter of the site and along I-10 for security and protection of sensitive biological resources. (Ex. 1003, p 4.12-4.)

The following evidence on Visual Resources was received into evidence on October 28, 2013: Exhibits 1003, 1005, 1012, 1015, 1016, 1019, 1020, 1021, 1025, 1026, 1033, 1034, 1076, 2000, 2002, 2003, 2008, and 4000. (10/28/13 RT 206:14 – 208:2.)

**Visual Resources - Table 1  
Key Project Components**

<b>Component</b>	<b>Dimensions (LxWxH) (Feet) / Capacity</b>	<b>Footprint (square feet)</b>
<b>Common Area</b>		
Administration Building	180 x 80 x 34	14,400
Maintenance and Electrical Shops and Warehouse	90 x 120 x 48	10,800
Fire Water Storage Tank	25 (diameter) 15 (height)	NA
Fire Water Pump House	12 x 36 x 10	432
Emergency Diesel Generator Enclosure	12 x 18 x 10	216
<b>Power Block #1</b>		
Solar Tower including Solar Receiver Steam Generators	75 (diameter) 750 (height)	NA
Steam Turbine Generator Enclosure	34 x 46 x 52	1,564
Air Cooled Condenser	220 x 300 x 120	NA
Steam Turbine Enclosure	40 x 56 x 52	2,240
Steam Turbine Generator Lube Oil Enclosure	22 x 38 x 18	836
Deaerator/Feedwater Heater Structure	56 x 66 x 80	NA
Emergency Diesel Generator Enclosure	12 x 32 x 12	384
Plant Service Building	56 x 100 x 16	5,600
ACC Power Distribution Center – North	14 x 50 x 16	700
ACC Power Distribution Center – South	14 x 50 x 16	700
Fire Water Pump House	36 x 12 x 12	432
Demineralized Water Storage Tank	26 (diameter) 26 (height)	NA
Service/ Firewater Storage Tank	40 (diameter) 30 (height)	NA
Mirror Wash Water Storage Tank	25 (diameter) 21 (height)	NA
Boiler Pump Power Distribution Center	50 x 14 x 16	700
Waste Water Storage Tank	25 (diameter) 23 (height)	NA
Water Treatment Power Distribution Center	30 x 14 x 16	420
Night Preservation Auxiliary Boiler	10 x 12 x 12	NA
Start-up Auxiliary Boiler	14 x 56 x 16	NA
Mirror Wash Vehicle Refueling and Storage Area Canopy	74 x 116 x 24	NA
Mirror Wash Vehicle Storage Area Canopy	40 x 184 x 20	NA
Wet Surface Air Cooler (WSAC)	48 x 36 x 26	NA
Thermal Evaporation Unit	34 x 18 x 64	NA
Residue Tank	12 (diameter) 13 (height)	NA
Water Treatment Building	66 x 90 x 26	5,940
Generator Step-up Transformer	12 x 26 x 22	NA
Drains Tank	12 (diameter) 13 (height)	NA
<b>Power Block #2</b>		
Solar Tower including Solar Receiver Steam Generators	75 (diameter) 750 (height)	NA
Steam Turbine Generator Enclosure	34 x 46 x 52	1,564
Air Cooled Condenser	220 x 300 x 120	NA
Steam Turbine Enclosure	40 x 56 x 52	2,240
Steam Turbine Generator Lube Oil Enclosure	22 x 38 x 18	836
Deaerator/Feedwater Heater Structure	56 x 66 x 80	NA

Component	Dimensions (LxWxH) (Feet) / Capacity	Footprint (square feet)
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Water Treatment Building	66 x 90 x 26	5,940
Generator Step-up Transformer	12 x 26 x 22	NA
Drains Tank	12 (diameter) 13 (height)	NA

(Ex. 2000, pp. 4.12-5 – 4.12-6.)

## THE CERTIFIED PROJECT'S IMPACTS AND MITIGATION

The final Energy Commission Decision certifying the PSPP concluded that although implementation of the conditions of certification would attenuate the significant direct, indirect, or cumulative impacts to visual resources, they would not lower all project-related visual impacts to less-than-significant levels. The Decision further concluded that although the project would comply with all federal, state and local LORS pertaining to visual resources, PSPP's visual impacts in combination with past and foreseeable future solar projects in the I-10 corridor would be cumulatively considerable. Still, the PSPP Decision made a finding that specific overriding economic, legal, social, technological or other benefits of the project outweighed the PSPP's significant effects on the environment.

Specifically, the PSPP Decision found that construction activities' impact on visual resources would be mitigated to a less-than-significant impact with the implementation of conditions of certification. There is no identified scenic resource on the project site or in the vicinity of the project site that the PSPP project would substantially damage. Also, the decision found that I-10 is not a state scenic highway. Further, the impact of PSPP's lighting to nighttime views would be less than significant with the implementation of mitigation measures in Condition of Certification **VIS-3**. Although

there is no federal, state, or local government designated scenic vista in the project vicinity, the PSPP would adversely affect non-designated panoramic and scenic vistas. The PSPP Decision found that the PSPP would introduce prominent structures with industrial character into the foreground to background views from I-10, SR 177, the BLM recreational access roads, nearby Wilderness Areas (WAs), and a few nearby residences, resulting in a substantial degradation of the existing visual character or quality of the site and its surroundings. All PSPP equipment other than the solar arrays would have non-reflective surfaces and neutral colors, which would not be a significant source of glare affecting daytime views.

Nevertheless, even after imposition of the conditions of certification, the PSPP, along with the Red Bluff Substation, were found to result in significant direct, indirect and cumulative visual impacts to non-designated scenic vistas from all five KOPs. (PSPP Final Decision, CEC-800-2010-011, **VISUAL RESOURCES**, pp. 30-31.)

## **THE AMENDED PROJECT IMPACTS**

### **Construction Impacts and Mitigation**

Construction of the PSEGS project will cause temporary visual impacts due to the presence of equipment, materials, and workforce. These impacts will occur at the proposed solar power plant site and along the transmission line route. Construction will involve the use of cranes, heavy construction equipment, temporary storage, office facilities, and temporary lay-down/staging areas. Construction will include site clearing and grading, construction of the actual facilities, and site cleanup and restoration. Visible traffic will also increase along I-10 and the BLM recreational access road during construction, and grading activities will generate large dust clouds that can be visually distracting if not controlled properly. Construction activities will be visible from I-10 (the primary travel corridor in the region), nearby BLM recreational access roads, the few residences in the area, SR 177, Palen McCoy Wilderness, and Chuckwalla Mountains Wilderness. Throughout the extensive construction period of approximately 33 months, the industrial character of the activities will constitute adverse and significant visual impacts. However, the vast majority of the area disturbed by construction will eventually be occupied by project facilities (see the “Operational Impacts and Mitigation” subsection below), though some areas of disturbed soil surfaces (characterized by high color, line, and texture contrasts) will remain and will be visible from the various viewing vantage points. These areas of residual disturbance will require successful restoration. Proper implementation of Condition of Certification **VIS-2** will ensure that the visual impacts of residual disturbed areas associated with project construction remain less than significant. Since construction activity will take place at night, Condition of Certification **VIS-3** will ensure that significant construction lighting impacts do not occur. Therefore, the PSEGS construction impacts to visual resources will be similar to the

impacts from the PSPP and remain less than significant. (Ex. 2000, pp. 4.12-10 – 4.12-11.)

### **Operational Impacts and Mitigation**

The CEQA Guidelines define a “significant effect” on the environment to mean a “substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including...objects of historic or aesthetic significance.” (Cal. Code Regs., tit. 14, §15382.) **Appendix G** of the Guidelines, under “Aesthetics” lists the following four questions to be addressed regarding whether the potential impacts of a project are significant:

1. Would the project have a substantial adverse effect on a scenic vista?
2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area? (Ex. 2000, pp. 4.12-6 – 4.12-7.)

The evidence includes a detailed visual analysis from representative Key Observation Points (KOPs). KOPs are generally selected to be representative of the most critical locations from which the project would be seen. KOPs are selected based on their usefulness in evaluating existing landscapes and potential impacts on visual resources with various levels of sensitivity from various vantage points. Typical KOP locations for the PSEGS project and alternatives include: (1) along major or significant travel corridors (I-10); (2) along recreational access 4WD roads and trails; (3) at key vista points; (4) from publicly accessible vantage points within designated Wilderness or other protected areas; and (5) at locations that provide good examples of the existing landscape context and viewing conditions. (Ex. 2000, p. 4.12-7.)

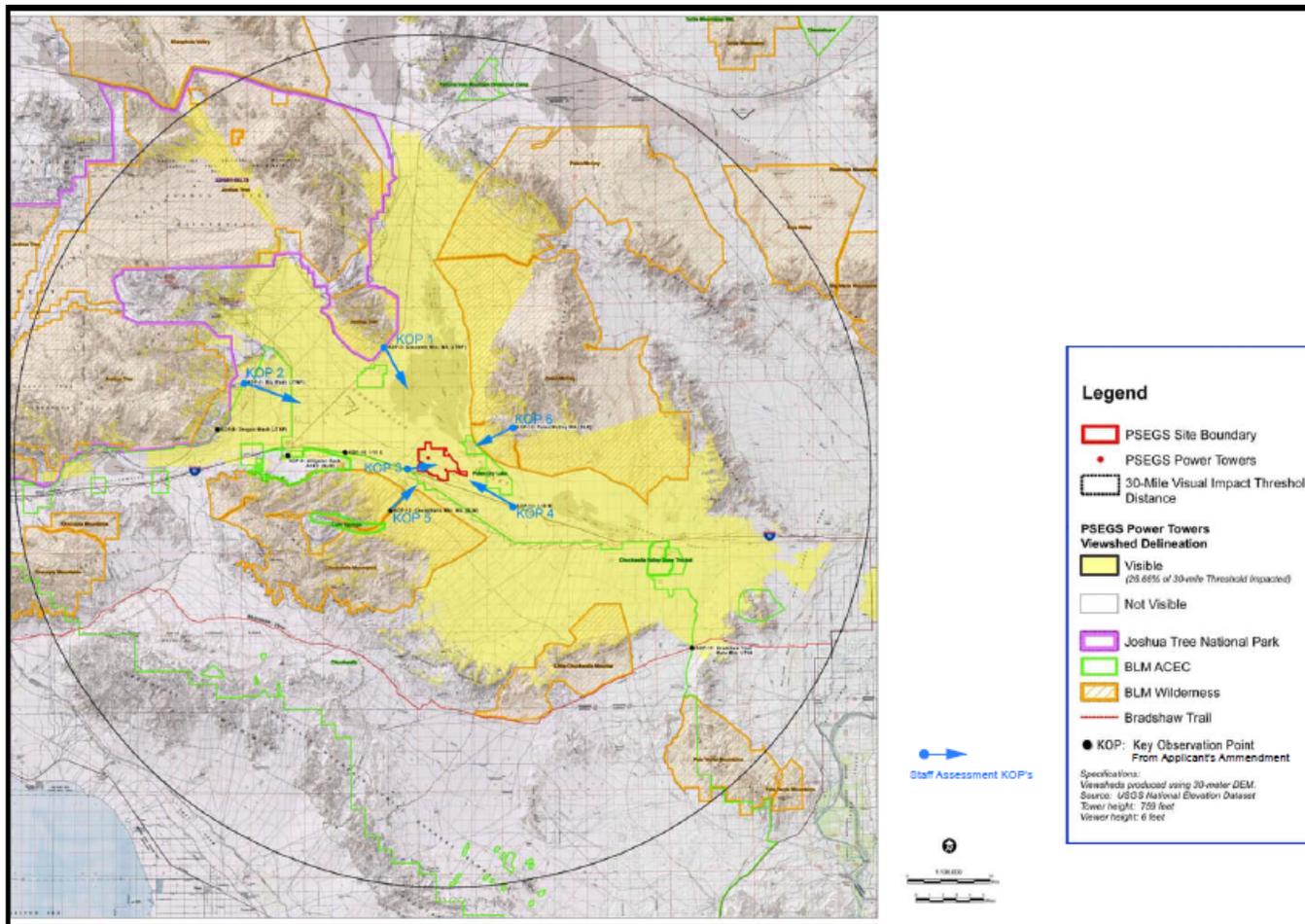
The record contains analyses of the following six KOPs:

- **KOP 1** (VRA 3) – SR-177, approximately seven miles northwest of the project site and approximately eight miles northwest of the nearest solar tower looking to the southeast. This KOP is representative of views from the SR-177 corridor. It also represents the nearest viewpoint within Joshua Tree National Park (JTNP);
- **KOP 2** (VRA 7) – Northwest of Desert Center, approximately 13 miles northwest of the project site and approximately 14 miles northwest of the nearest solar tower

looking southeast. This viewpoint is the second nearest viewpoint to the project within JTNP;

- **KOP 3** (AFC 8B) – Eastbound I-10 approximately 0.5 mile west of the western boundary of the project site and approximately 1.5 miles southwest of the nearest solar tower looking to the east. This KOP represents the experience of I-10 motorists (eastbound);
- **KOP 4** (VRA 13) – Westbound I-10 approximately six and four-tenths miles southeast of the southeast corner of the project site and approximately five and seven-tenths miles southeast of the nearest solar tower looking to the northwest. This KOP represents the experience of I-10 motorists (westbound);
- **KOP 5** (VRA 12) – Chuckwalla Mountains Wilderness approximately five miles southwest of the project site, and approximately six miles southwest of the nearest solar tower looking to the northeast. This KOP represents elevated views within the Chuckwalla Mountains Wilderness at background distance; and
- **KOP 6** (VRA 15) – Palen McCoy Wilderness approximately three and a half miles northeast of the project site and approximately four and a half miles northeast of the nearest solar tower looking to the southwest. This KOP represents elevated views within the Palen McCoy Wilderness at middle-ground distance. (Ex. 2000, pp. 4.12-7 – 4.12-8.)

## Key Observation Points (KOPs) - Visual Resources – Figure 1



CALIFORNIA ENERGY COMMISSION - SITING, TRANSMISSION AND ENVIRONMENTAL PROTECTION DIVISION  
SOURCE: 3DScape

(Ex. 2000, Visual Resources, Figure 1.)

Visual Resources  
7.5-7

## **Scenic Vistas**

“Would the project have a substantial adverse effect on a scenic vista?”

For the purposes of this analysis, a *scenic vista* is defined as a designated scenic vista (identified in public planning documents) as “a view of high scenic quality perceived through and along a corridor or opening, or a view from a designated scenic area.” While not the sole criterion for designation of WAs, preservation of scenic values is a key concern underlying the Wilderness Act. (P.L. 88-577 [16 U.S. C. 1131-1136].)

Although no designated scenic vistas were identified in the study area, panoramic and highly scenic vistas are available to back-country recreationists that access the southern ridges of the Palen McCoy Wilderness and the northeastern ridges of the Chuckwalla Mountains Wilderness. Both areas overlook the expansive Chuckwalla Valley ringed by distinguishable mountain ranges. The extremely bright glare from the project’s two solar receivers will be seen from the two WAs at distances of as little as four and a half miles. At this distance, the evidence suggests that the solar receiver steam generators (SRSGs) will appear to viewers as very bright and prominent. While not physically dangerous, this level of brightness in the WAs within the view-shed of the SRSGs will make viewing in the direction of the towers uncomfortable as a result of the substantial adverse glare effects. The detailed analysis in evidence shows that the project will be prominently visible from both WAs and the introduction of glare, industrial character, and structural visual contrast will result in substantial adverse effects on KOPs 5 and 6, as well as KOPs 1 and 2. (Ex. 2000, pp. 4.12-8 – 4.12-9.)

Accordingly, we find that the amended PSEGS project will have a substantial adverse effect on a scenic vista.

## **Scenic Resources**

“Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?”

For the purpose of this analysis, *scenic resources* include a unique water feature (waterfall, transitional water, part of a stream or river estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique/historical importance to a community (a tree linked to a famous event or person, an ancient or old growth tree); a historic building; or other scenically-important physical features, particularly if located within a designated federal scenic byway or state scenic corridor.

The Chuckwalla Valley floor consists primarily of desert scrub vegetation. The project site is located adjacent and to the north of I-10, which is not listed as an eligible State Scenic Highway, and there are no notable scenic features or historic structures located

within the site. We find that the project will not substantially damage scenic resources such as trees, rock outcroppings or historic buildings within a state scenic highway. (Ex. 2000, pp. 4.12-9 – 4.12-10.)

**Visual Character or Quality**

”Would the project substantially degrade the existing visual character or quality of the site and its surroundings?”

The evidence contains a detailed analysis of PSEGS visual impacts for the view areas represented by the key viewpoints. A summary of the operation impact analysis is presented in **Visual Resources - Table 2**. The analysis in the record assesses the overall viewer concern and exposure relative to the visual quality to determine whether the overall viewer sensitivity is low, moderate, or high. Then, for each KOP, an evaluation of visual contrast, project dominance, and view blockage is presented with a concluding assessment of the overall degree of visual change caused by the proposed project. Visual change is then considered within the context of the landscape’s visual sensitivity to arrive at a determination of visual impact significance. (Ex. 2000, pp. 4.12-10 – 4.12-27.)

**Visual Resources - Table 2  
KOP Ratings: Visual Sensitivity/Visual Change and  
Impact Significance under CEQA Criterion C**

KOP No.	VISUAL SENSITIVITY (Existing Condition)						
	Visual Quality	Viewer Concern	Viewer Exposure				Overall Visual Sensitivity
			Visibility	No. of Viewers	Duration of View	Overall Viewer Exposure	
<b>1 SR 177 Corridor/ Coxcomb Mt. (JTNP)</b>	Moderately low	High	High	Moderate	High	Moderately high	Moderately high
<b>2 Northwest of Desert Center/ Big Wash (JTNP)</b>	Moderate	High	High	Low	High	Moderate to High	Moderately high
<b>3 Eastbound I-10</b>	Moderate	Moderately high	High	High	High	High	Moderately high
<b>4 Westbound I-10</b>	Moderate	Moderately high	High	High	High	High	Moderately high
<b>5 Corn Springs Road/ Chuckwalla</b>	Moderately high	High	High	Low	High	Moderately high	Moderately high

<b>Mountains Wilderness</b>							
<b>6 Palen McCoy Wilderness</b>	Moderate high	High	High	Very Low	High	Moderate	Moderately high
<b>KOP No.</b>	<b>VISUAL CHANGE (Project Effect)</b>						
			<b>View Blockage</b>				
	<b>Contrast</b>	<b>Dominance</b>		<b>Overall Visual Change</b>			
<b>1 SR 177 Corridor/ Coxcomb Mt. (JTNP)</b>	High	Dominant	Moderate	Moderately high			
<b>2 Northwest of Desert Center/ Big Wash (JTNP)</b>	Moderate	Co-Dominant	Moderately low	Moderate			
<b>3 Eastbound I-10</b>	High	Dominant	High	High			
<b>4 Westbound I-10</b>	High	Dominant	High	High			
<b>5 Corn Springs Road/ Chuckwalla Mountains Wilderness</b>	High	Dominant	Moderately high	High			
<b>6 Palen McCoy Wilderness</b>	High	Dominant	Moderately high	High			
<b>KOP No.</b>	<b>KOP VISUAL IMPACT SIGNIFICANCE DETERMINATION – (CEQA Criterion C)</b>						
	<b>Overall Visual Sensitivity</b>	<b>Overall Visual Change</b>		<b>Visual Impact Significance</b>	<b>Mitigation</b>		
<b>1 SR 177 Corridor/ Coxcomb Mt. (JTNP)</b>	Moderately high	High		Significant	VIS-1, -2, -3, -4 Significant and unavoidable		
<b>2 Northwest of Desert Center/ Big Wash (JTNP)</b>	Moderately high	Moderate		Significant	VIS-1, -2, -3, -4 Significant and unavoidable		
<b>3 Eastbound I-10</b>	Moderately high	High		Significant	VIS-1, -2, -3, -4 Significant and unavoidable		
<b>4 Westbound I-10</b>	Moderately high	High		Significant	VIS-1, -2, -3, -4 Significant and unavoidable		
<b>5 Corn Springs</b>	Moderately	High		Significant	VIS-1, -2, -3, -4		

<b>Road/ Chuckwalla Mountains Wilderness</b>	high			Significant and unavoidable
<b>6 Palen McCoy Wilderness</b>	Moderately high	High	Significant	VIS-1, -2, -3, -4 Significant and unavoidable

(Ex. 2000, pp. 4.12-26 – 4.12-27.)

The evidence clearly and convincingly establishes that the PSEGS project will introduce prominent structures with industrial character into the foreground to background views from SR 177 and the Desert Center area (KOPs 1 and 2), I-10, Corn Springs Road (KOPs 3, 4 and 5), nearby WAs, JTNP (see KOPs 1 and 2), and a few nearby residences. The resulting visual change ranges from moderate to high among these KOPs and, overall, results in a substantial degradation of the existing visual character or quality of the site and its surroundings. (Ex. 2000, p. 4.12-10.)

### **Mitigation**

Given the large scale of the impact area and the height and glare of the solar towers, no available mitigation measures were identified that would be adequate to mitigate the significant visual impacts to less-than-significant levels. However, the following conditions of certification which will remain in force minimize structure contrast and lighting and glare impacts to the extent possible: **VIS-1**, Surface Color Treatment of Structures; **VIS-2**, Revegetation of Disturbed Soil Areas; and **VIS-3**, Temporary and Permanent Exterior Lighting. Conditions of Certification **VIS-1**, **VIS-2**, and **VIS-3** come from the PSPP Decision. We will also impose Condition of Certification **TRANS-7** to address inadvertent DSRH glint impacts both during and prior to project operation. Nevertheless, impacts will still remain significant and unavoidable. (Ex. 2000, p. 4.12-14.)

### **Non-Operation and Facility Closure**

After the end of the project's useful life, the project owner will be required to close the facility. The complete removal of the facility will leave a very prominent visual impact over the entire site due to the strong color contrast created between graded, disturbed soil areas and undisturbed soil areas near the project site. In addition, revegetation of areas in this desert region are difficult and generally of limited success. Thus, visual recovery from land disturbance of the facility closure would likely occur only over a very long period of time. (Ex. 2000, p. 4.12-27.)

## Light and Glare

“Would the project create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?”

Glare is defined as a difficulty in seeing in the presence of bright light, and is caused by a significant ratio of luminance between the task (that which is being looked at) and the glare source. Glare can be generally divided into two types, discomfort glare and disability glare. Discomfort glare results in an instinctive desire to look away from a bright light source or difficulty in seeing a task. Disability glare renders the task impossible to view, such as when driving westward at sunset. (Ex. 2000, p. 4.12-28.)

According to data provided by the Petitioner, the SRSGs will have a maximum luminance of  $1 \times 10^6$  cd/ m<sup>2</sup>. The record suggests that the SRSGs would appear very bright and distracting, demanding visual attention and eliciting visual fixation to distances of 10 miles or greater, but would not be a source of either discomfort or disability glare. However, the SRSG brightness will be very high dominating the landscape when in the field of view demanding viewers' attention and exhibiting high levels of visual contrast to distances of 10 miles or greater. Under conditions of moderate or high overall visual sensitivity of viewers, we consider this level of contrast a significant adverse visual impact. There appear to be no feasible measures that would mitigate this significant impact. (Ex. 2000, p. 4.12-28.)

## Non-Reflective Facility Surfaces

Surfaces of the facilities of the PSEGS project (excluding the solar receivers and the mirrored surfaces of the heliostats, which are discussed below) have the potential to introduce reflected glare into the visual environment. With the effective implementation of Condition of Certification **VIS-1** from the PSPP Commission Decision, the project would use colors and finishes on surfaces other than mirrors and solar receivers that do not cause excessive glare and would be in harmony with the project's desert environment. (Ex. 2000, p. 4.12-28.)

## Heliostats

The evidence describes the potential for inadvertent direct solar reflections from the heliostats both during and prior to project operation, particularly during the project's mirror-calibration phase. The evidence suggests that direct solar reflections from the heliostats will exceed the threshold for discomfort glare for minimum viewing distances of 10 miles. Therefore, we will require measures to address the direct solar reflections from the heliostats that are found in Condition of Certification **TRANS-7**, Heliostat Positioning and Monitoring Plan. This condition will reduce impacts from direct solar reflections from the heliostats to less-than-significant levels. (Ex. 2000, p. 4.12-28.)

When observed from a distance during operations, the heliostat fields generally reflect a portion of the sky to the viewer. In the region closer to the tower, the heliostats often reflect a portion of the sky in greater proximity to the sun and these regions appear brighter and whiter producing a low to moderate level of sustained glare depending on viewing geometry and range. Elsewhere in the mirror field, reflections of the sky are visible creating a “lake effect.” These heliostat reflections from the mirror fields as a whole will be prominent and will contribute to the overall visual contrast of the project as seen from various KOPs, as discussed under Visual Character and Quality (Criterion C) above. However, this type of heliostat glare would not cause either disability or discomfort glare and is not considered a significant glare impact here under Light and Glare (Criterion D). (Ex. 2000, pp. 4.12-28 – 4.12-29.)

### **Solar Power Towers/SRSGs**

The visual impact of glare from the SRSGs will have a significant and unavoidable impact.

The principal project visual impact will result from glare of the SRSGs. The record establishes that the SRSGs will appear very bright and distracting, demanding visual attention and eliciting visual fixation to distances of 10 miles or greater, but, like the heliostats above, will not be a source of either discomfort or disability glare. Still, based on the luminance level cited in evidence and the analysis of the project site and viewing conditions, we find that SRSG brightness will appear very high dominating the landscape when in the field of view, demanding viewers’ attention and exhibiting high levels of visual contrast to distances of 10 miles or greater. Where the evidence indicates moderate or high overall visual sensitivity of viewers, we find this level of contrast to be a significant visual impact. (Ex. 2000, p. 4.12-29.)

There is also potential glare from shield structures located directly above and below the SRSGs. These reflective structures shield the tower support structure from the heat of stray heliostat reflections. If inadvertently lit by stray mirror reflections, these surfaces may act as large glare sources and may be brighter glare sources than the SRSGs themselves. However, with implementation of Condition of Certification **TRANS-7**, this impact can be avoided. (Ex. 2000, p. 4.12-29.)

### **Night Lighting and FAA Safety Lighting**

Nighttime light pollution could result from project operational lighting and from FAA warning lighting required to be affixed to the solar towers. With effective implementation of light trespass mitigation measures as described in Condition of Certification **VIS-4** (**VIS-3** from the PSP Decision), the PSEGS off-site operation related lighting impacts, excluding FAA safety lighting, will be less than significant. Condition of Certification **VIS-4** requires a comprehensive lighting plan be submitted to Riverside County for review

and comment and to the Energy Commission compliance project manager (CPM) for review and approval. Condition of Certification **VIS-4** will ensure full compliance and verification of night lighting measures. (Ex. 2000, p. 4.12-30.)

The addition of the aviation safety lighting will alter the nighttime appearance of the project area and will be visible in the night sky due to the height of the towers and the number of lights required by the towers' size. The brightest FAA-required lighting of medium- or high-intensity white flashing lights would apply during the day and twilight. At night, these would be replaced by less bright non-flashing red safety lighting. Due to the height of the towers, FAA could require both high-intensity flashing white lights or non-luminous marking in addition to medium-intensity flashing white lights for daytime and twilight use. During daytime operation, both high-intensity FAA lighting *and* non-luminous marking would tend to be visually obscured by the much greater brightness of SRSG glare. Since views in the direction of the solar towers during daytime will tend to cause viewers to avert their gaze, both the safety lighting and tower marking would be subordinate to the brighter SRSG glare. (Ex. 2000, p. 4.12-30.)

Nighttime light pollution impacts would be of particular concern to visitors to the Palen/McCoy WA, the Chuckwalla Mountains WA, and the JTNP. The pristine, completely unlit night sky is part of the attraction of virtually all WAs within the California desert, and is often cited as a valued attraction of the desert for campers. However, the evidence indicates that night light pollution effects of the project, including nighttime FAA lighting with appropriate mitigation measures as described in Condition of Certification **VIS-4**, will not be substantial beyond background distances of very roughly four or five miles. The project will be visible from the portions of Palen/McCoy and Chuckwalla Mountains WAs that lie within this estimated radius of substantial night lighting effect. Camping is permitted throughout the WAs and it is assumed that camping may occur at undesignated sites within four miles of the project site. The Corn Springs Campground is located on Corn Springs Road approximately five miles southwest of the project site in an east-west canyon that screens views of the project site from the campground. Therefore, campers at the Corn Springs Campground would not be affected by project night lighting. Project lighting effects would potentially be more pronounced to WA visitors within four miles of the project. With Condition of Certification **VIS-4**, off-site effects of bright operational lighting of the power block will be mitigated to a less-than-significant level. The safety lighting will not represent a very bright or highly distracting light source. We can assume that campers with concern for pristine completely unlit night skies will seek that experience in more remote locations of the WAs. This, together with the fact that the number of visitors to the WAs is believed to be low, leads us to the conclusion that night lighting impacts to visitors in the WAs will be less than significant. (Ex. 2000, pp. 4.12-30 – 4.12-31.)

## **Cumulative Impacts**

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Cal. Code Regs., tit. 14, § 15130.)

Cumulative impacts to visual resources would occur where project facilities occupy the same field of view as other built facilities or impacted landscapes, and an adverse change in the visible landscape character is perceived. In some cases, a cumulative impact could also occur if a viewer perceives that the general visual quality or landscape character of a localized area (Chuckwalla Valley or I-10 corridor) or larger region (California Desert District) is diminished by the proliferation of visible structures or construction effects, even if the changes are not within the same field of view as existing (or future) structures or facilities. The result is a perceived "industrialization" of the existing landscape character. (Ex. 2000, p. 4.12-31.) There is the potential for substantial future development in the Chuckwalla Valley area along the I-10 corridor and throughout the California Desert District.

### **Cumulative Visual Impacts within the Project Viewshed**

There has been minimal development and/or industrialization of the project landscape within PSEGS view-shed. Four existing projects fall within the view-shed of PSEGS including I-10, the West-wide section 368 Energy Corridor, the Eagle Mountain/Hayfield Pumping Plant, and the Kaiser (Eagle) Mine. Interstate 10 is visible as a linear, horizontal feature in the landscape, but does not possess industrial character (complex forms or lines) on the scale of an energy facility such as PSEGS. The West-wide section 368 Energy Corridor is a designation that implies the possibility of future linear projects within the corridor. However, the actual corridor designation does not impart any visual impact that could be considered in a cumulative context. The Eagle Mountain/Hayfield Pumping Plant, while potentially visible within the field of view of PSEGS (at a distance of slightly over 14 miles) is minimally noticeable at the distant margin of the view-shed limit. Views of much of the inactive open-pit Kaiser/Eagle Mine are screened from the project site by intervening hills. The remainder of the Kaiser Mine located approximately 15 miles east of the project site is minimally noticeable at the distant margin of the viewshed limit. Therefore, given the relative lack of perceptible industrial development (or development with characteristics similar to that of the PSEGS project) that has occurred within the PSEGS viewshed, PSEGS would not cause a cumulatively considerable effect within the context of existing cumulative conditions. (Ex. 2000, p. 4.12-32.)

**Project Description - Tables 2, 3 and 4** list 37 future foreseeable projects that would be located within the PSEGS viewshed including:

- Devers-Palo Verde 2 Transmission Line Project
- Desert Southwest Transmission Line
- Green Energy Express Transmission Line Project
- Blythe Energy Project Transmission Line
- Eagle Mountain Pumped Storage Project
- Eagle Mountain Landfill
- Eagle Mountain Wind Project
- Graham Pass Wind Project
- Genesis Solar Energy Project
- Chuckwalla Solar I
- Desert Sunlight
- Desert Lily Soleil
- Desert Center 50
- Sol Orchard
- Silverado Power I, II, III
- Desert Harvest
- LH Renewables Riverside County Type II
- EnXco
- Blythe Energy Project II
- Blythe Solar Power Generation Station 1
- Blythe Mesa Solar I
- Milpitas Wash
- Sonoran West
- Mule Mountain Solar
- Mule Mountain III
- Desert Quartzite

- Nextlight Quartzite
- Palo Verde Mesa Solar Project
- La Posa Solar Thermal
- Three Residential (Blythe)
- 12 Residential Developments (Blythe)
- Four Commercial Projects (Blythe)
- Intake Shell
- Chuckwalla Valley Raceway
- Red Bluff Substation
- Colorado River Substation Expansion
- Wileys Well Communication Tower

While most of these projects are energy projects that would share similar visual characteristics with PSEGS, all 37 projects would contribute to the conversion of natural desert landscapes to landscapes with prominent industrial character (complex industrial forms and lines and surface textures and colors not found in natural desert landscapes). Therefore, there would be a significant cumulative impact to visual resources from the combination of PSEGS and the 37 foreseeable projects listed above, both individually (each project plus PSEGS) and collectively (all 37 projects plus PSEGS). (Ex. 2000, pp. 4.12-32 – 4.12-34.)

### **Regional Cumulative Visual Impacts**

**Project Description Tables - 2, - 3 and - 4** also identify an additional nine future foreseeable energy projects along the I-10 corridor that would also contribute to the sense of industrialization of the desert landscape as one drives between Blythe and Desert Center, or Los Angeles and Phoenix in a broader context. In a regional context, the PSPP record identified 125 renewable energy projects scattered throughout the California Desert Conservation Area. This number of projects is so great that there would not be a single major travel corridor through the Southern California desert that would not experience at least some visible “industrialization” due to the presence of nearby energy projects. As a result, travelers would encounter numerous industrial landscapes en-route to regionally and nationally significant desert destinations such as Anza-Borrego Desert State Park, the Salton Sea, JTNP, Mojave National Preserve, Death Valley National Park, and the Colorado River. Therefore, as a result of this collective industrialization of the conservation area landscapes, PSEGS would

contribute a significant cumulative visual impact to visual resources in combination with foreseeable renewable projects in the California desert. (Ex. 2000, p. 4.12-34.)

### **Overall Cumulative Impact Conclusion**

PSEGS would not result in a cumulative visual impact in the context of existing cumulative conditions. However, the PSEGS contribution to the visible industrialization of the desert landscape would be cumulatively considerable and constitute a significant visual impact when considered with future foreseeable projects, both within the project view-shed and in a broader context that encompasses the whole of the California Desert Conservation Area (CDCA).

### **COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)**

The record indicates that the project will comply with all relevant federal and state LORS including the impact disclosure requirements of the CDCA Plan. The PSEGS project complies with the State Scenic Highway Program as pertains to scenic highway management objectives because the adjacent I-10 is neither an eligible or designated scenic highway under the state program. (Ex. 2000, p. 4.12-35.)

However, evidence suggests that the project would not be in compliance with several County of Riverside requirements pertaining to protection/preservation of natural features, the visual character of the existing landscape, and scenic corridors. These requirements are found in Conditions of Certification **LU 13.1** (preservation of scenic vistas), **LU 13.3** (compatible appearance with surrounding environment), **LU 20.1** (environmental character), **LU 20.2** (avoid unnatural appearance), and **LU 20.4** (open space and rural character). Also, the project would not be in compliance with several landscaping requirements because landscaping is not proposed. However, given the arid conditions and remote location, Staff and Applicant seem to agree that these requirements found in **LU 4.1(c)**, **LU 4.1(d)**, **LU 4.1(m)**, **LU 4.1(n)**, and **LU 4.1(p)** are not applicable to the PSEGS project. (Ex. 2000, p. 4.12-35.)

### **FINDINGS SPECIFIC TO AN AMENDMENT**

As we noted in the **INTRODUCTION** to this Decision, the approval of an amendment to a certified power plant requires two findings in addition to the findings necessary to approve an initial power plant license. First, we must determine whether the change in the project will be beneficial to the public, Applicant, or Intervenors. Secondly, we must determine whether there has been a substantial change in circumstances since the original approval justifying the change or that the change is based on information that was not known and could not have been known with the exercise of reasonable diligence prior to the original approval. We have already found this second finding to be

true (see the **PROJECT DESCRIPTION** section of this Decision). (Cal. Code Regs., tit. 20, §§1769(a)(3)(C) and 1769(a)(3)(D).)

## **BENEFITS**

Throughout this Decision, we describe various benefits that will accrue from the construction and operation of the PSEGS with the modifications proposed in the amendment. While the development of the PSEGS project is intended to address the requirements of federal and state mandates to develop renewable energy, the PSEGS project, like the approved PSPP project, will not yield any noteworthy public benefits related to visual resources.

## **PUBLIC COMMENT**

The following comments were received from the public regarding Visual Resources:

On September 6, 2013, **Fred Rinne** expressed opposition to the project because it would create visual blight on areas of wilderness and national park lands.

**Tiffany North**, Deputy County Counsel for the County of Riverside, submitted comments that there was no mitigation for the significant, adverse direct and cumulative impacts on the County's scenic vistas, desert wilderness, and view shed on October 29, 2013.

**Brendan Hughes** wrote, on November 13, 2013, that the proposed project towers would be visible from multiple Bureau of Land Management wilderness areas and from Joshua Tree National Park ruining the relatively unspoiled vista to the south of the Palen-McCoy Wilderness Area. He argued that there were no effective mitigation measures to these impacts to visual resources.

**Joan Taylor**, Chair of the California-Nevada Desert Energy Committee for the Sierra Club, commented at the October 29, 2013 evidentiary hearing. She discussed the existing solar tower at Coalinga and described it as being visible from 10 miles away.

On November 25, 2013, **Paul Smith** of the Tourism Economics Commission submitted written comments regarding the impacts on the vistas from Joshua Tree National Park. The letter cited to a study conducted by the University of Idaho that found that 90 percent of the visitors came to Joshua Tree because of the views unspoiled by development, as well as 65 percent being attracted by the dark, starry-night skies that would be interrupted by the lighted solar towers.

Also on November 25, 2013, **Tom Budlong** described his recent exposure to solar tower technology. He stated that when the tower is lit up (and sometimes not lit up), there is a halo around the top. The thickness of the tower is about one receiver (heliostat?) width. He also noted that there are two halos on either side of the tower and

they're about one receiver width away from it. He finds the pictures of the Ivanpah facility being tested to be "scary."

The **Morongo Basin Conservation Association** submitted two letters in early December. The first, on December 4, 2013, cited discrepancies between the analysis of the FSA and the analysis by the Bureau of Land Management. On December 6, 2013, the association raised similar concerns particularly regarding the appropriate height measurement for the towers.

**Andrea Compton** of the National Park Service commented on April 7, 2014, regarding her concerns regarding visual impacts to Joshua Tree National Park. She recommends denial of the petition because the benefits do not outweigh the impacts.

On July 25, 2014, **David Lamfrom** from the National Parks Conservation Association commented that he supported denying the petition to amend due to reports about ISEGS indicating a high level of avian mortality as well as visual impacts to Joshua Tree National Park, including night sky impacts.

These concerns are all addressed above.

## **FINDINGS OF FACT**

Based upon the evidence, we make the following findings:

1. Construction will occur over approximately 33 months.
2. The project's temporary construction activities' impact on visual resources will be mitigated to less than significant with the effective implementation of Conditions of Certification **VIS-2** and **VIS-3**.
3. There is no federal, state, or local government designated scenic vista in the project vicinity.
4. Non-designated panoramic and scenic vistas are present and the proposed project will adversely affect these vistas.
5. There is no identified scenic resource on the project site.
6. There is no defined scenic resource identified in the vicinity of the project site that the proposed project would substantially damage.
7. Interstate 10 is not a State Scenic Highway.
8. The PSEGS will introduce prominent structures with industrial character into the foreground to background views from I-10, SR 177, the BLM recreational access roads, nearby WAs, and a few nearby residences, resulting in a substantial degradation of the existing visual character or quality of the site and its surroundings.

9. The impact of the PSEGS lighting to nighttime views will be less than significant with the effective implementation of the specified mitigation measures and Condition of Certification **VIS-4**.
10. The PSEGS will introduce a significant new source of substantial light or glare in the area that will adversely affect daytime or nighttime views.
11. All PSEGS equipment, other than the solar arrays, will have non-reflective surfaces and neutral colors such that the project structures will not be a significant source of glare that could adversely affect daytime views.
12. The PSEGS project's potential impacts on visual resources were analyzed from six defined KOPs.
13. Construction of the PSEGS will result in significant visual impacts to non-designated scenic vistas from KOPs 1, 2, 3, 4, 5, and 6.
14. Effective implementation of Conditions of Certification **VIS-1**, **VIS-2**, **VIS-3**, and **VIS-4** will be required for impacts to views represented by KOPs 1, 2, 3, 4, and 5, but will not lower impacts to these KOPs to less-than-significant levels.
15. The visual effects of the PSEGS and transmission line in combination with past, present, and reasonably foreseeable projects in the I-10 corridor will substantially contribute to significant cumulative visual impacts.
16. As we found in **ALTERNATIVES**, the Reduced Acreage Alternative with Solar Power Technology will have either similar or lesser impacts than the proposed PSEGS.

## **CONCLUSIONS OF LAW**

1. Implementation of the following Conditions of Certification will result in attenuation of significant direct, indirect, or cumulative impacts to visual resources, but will not lower all project-related impacts to less-than-significant levels.
2. The PSEGS project will comply with federal and state LORS, but will not comply with local applicable LORS pertaining to visual resources.
3. The PSEGS will contribute to anticipated cumulative visual impacts of past and foreseeable future solar projects in the I-10 corridor that are considered cumulatively considerable and potentially significant.
4. A Statement of Overriding Considerations would be required to approve the Petition for Amendment because direct and cumulative impacts associated with the PSEGS project will not be reduced to less-than-significant levels.

5. PSEGS is described at a level of detail sufficient to allow review in compliance with the provisions of both the Warren-Alquist Act and the California Environmental Quality Act.
6. The change in the project will not yield any noteworthy public benefits related to visual resources.
7. There has been a substantial change in circumstances since the original approval justifying the change in that the change in technology could not have been anticipated during the original permitting process because, at the time of the original licensing, the project was wholly-owned by Solar Millennium whose plans involved developing its own proprietary parabolic trough technology. PSH did not acquire the project site until after the Commission's Final Decision on the PSPP.

## **CONDITIONS OF CERTIFICATION**

### **SURFACE TREATMENT OF PROJECT STRUCTURES AND BUILDINGS**

**VIS-1** The project owner shall treat the surfaces of all project structures and buildings visible to the public such that a) their colors minimize visual intrusion and contrast by blending with (matching) the existing characteristic landscape colors; b) their colors and finishes do not create excessive glare; and c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective, and the insulators shall be non-reflective and non-refractive.

Following in-field consultation with the Energy Commission/the BLM Visual Resources specialist and other representatives as deemed necessary, the project owner shall submit, for Energy Commission CPM review and approval, a specific Surface Treatment Plan that will satisfy these requirements. The treatment plan shall include:

- A. A description of the overall rationale for the proposed surface treatment, including the selection of the proposed color(s) and finishes based on the characteristic landscape. Colors will be field tested using the actual distances from the KOPs to the proposed structures, using the proposed colors painted on representative surfaces;
- B. A list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified

by vendor, name, and pantone number, or according to a universal designation system;

- C. One set of color brochures or color chips showing each proposed color and finish;
- D. A specific schedule for completion of the treatment; and
- E. A procedure to ensure proper treatment maintenance for the life of the project.

The project owner shall not specify to the vendors the treatment of any buildings or structures treated during manufacture or perform the final treatment on any buildings or structures treated in the field until the project owner receives notification of approval of the treatment plan by the CPM. Subsequent modifications to the treatment plan are prohibited without CPM approval.

**VERIFICATION:** At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the project owner shall submit the proposed treatment plan to the CPM for review and approval and simultaneously to the BLM and Riverside County for review and comment. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a plan with the specified revision(s) for review and approval by the CPM before any treatment is applied. Any modifications to the treatment plan must be submitted to the CPM for review and approval.

Prior to the start of commercial operation, the project owner shall notify the CPM that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit to each one set of electronic color photographs from the same key observation points identified in (d) above. The project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify: a) the condition of the surfaces of all structures and buildings at the end of the reporting year; b) maintenance activities that occurred during the reporting year; and c) the schedule of maintenance activities for the next year.

## **RE-VEGETATION OF DISTURBED SOIL AREAS**

**VIS-2** The project owner shall minimize visual disturbances due to construction and re-vegetate disturbed soil areas to the greatest practical extent as described in Condition of Certification **BIO-8**, measures 1, 2, 5, and 21. In order to address specific visual concerns, the required spreading of preserved topsoil shall include reclamation of the area of disturbed soils

used for lay-down, project construction, and siting of the other ancillary operation and support structures that appear in the visual foreground of I-10.

**VERIFICATION:** Refer to Condition of Certification **BIO-8**.

### **TEMPORARY AND PERMANENT EXTERIOR LIGHTING**

**VIS-3** To the extent feasible, consistent with safety and security considerations, the project owner shall design and install all permanent exterior lighting and all temporary construction lighting such that a) lamps and reflectors are not visible from beyond the project site, including any off-site security buffer areas; b) lighting does not cause excessive reflected glare; c) direct lighting does not illuminate the nighttime sky except for required FAA aircraft safety lighting (which should be an on-demand, audio-visual warning system that is triggered by radar technology); d) illumination of the project and its immediate vicinity is minimized; and e) the plan complies with local policies and ordinances. The project owner shall submit to the CPM for review and approval, and simultaneously to the BLM and County of Riverside for review and comment, a lighting mitigation plan that includes the following:

- A. Location and direction of light fixtures shall take the lighting mitigation requirements into account;
- B. Lighting design shall consider setbacks of project features from the site boundary to aid in satisfying the lighting mitigation requirements;
- C. Lighting shall incorporate fixture hoods/shielding with light directed downward or toward the area to be illuminated;
- D. Light fixtures that are visible from beyond the project boundary shall have cutoff angles that are sufficient to prevent lamps and reflectors from being visible beyond the project boundary, except where necessary for security;
- E. All lighting shall be of minimum necessary brightness consistent with operational safety and security;
- F. Lights in high illumination areas not occupied on a continuous basis (such as maintenance platforms) shall have (in addition to hoods) switches, timer switches, or motion detectors so that the lights operate only when the area is occupied; and

- G. The lighting plan shall demonstrate that plant operational lighting (excluding FAA and emergency lighting) will, to the extent practical, not be directly reflected upward or off site by heliostats in nighttime stow position. Control measures for eliminating such reflections shall be incorporated in the HMPP specified in Condition of Certification **TRANS-7**.

**VERIFICATION:** At least 90 days prior to ordering any permanent exterior lighting or temporary construction lighting, the project owner shall contact the CPM to discuss the documentation required in the lighting mitigation plan. At least 60 days prior to ordering any permanent exterior lighting, the project owner shall submit to the CPM for review and approval, and simultaneously to the BLM and County of Riverside for review and comment, a lighting mitigation plan. If the CPM determines that the plan requires revision, the project owner shall provide to the CPM a revised plan for review and approval.

The project owner shall not order any exterior lighting until receiving CPM approval of the lighting mitigation plan.

Prior to commercial operation, the project owner shall notify the CPM that the lighting has been completed and is ready for inspection. If, after inspection, the CPM notifies the project owner that modifications to the lighting are needed, within 30 days of receiving that notification the project owner shall implement the modifications and notify the CPM that the modifications have been completed and are ready for inspection.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the CPM with a complaint resolution form report as specified in the **COMPLIANCE AND CLOSURE** section General Conditions, including a proposal to resolve the complaint and a schedule for implementation. The project owner shall notify the CPM within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be submitted to the CPM within 30 days.

## VIII. OVERRIDE FINDINGS

Based on our analysis of the evidence in this proceeding, we find that the Palen Solar Energy Generating System (PSEGS) will cause or contribute to significant direct and cumulative environmental impacts, and specific considerations, discussed in the **PROJECT ALTERNATIVES** section, make infeasible the mitigation measures and project alternatives identified in this Decision, with the exception of Reduced Acreage Alternative with Solar Power Tower Technology.

CEQA prohibits a public agency from approving a project which identifies one or more significant effects on the environment unless all of the following occur:

(a) The public agency makes one or more of the following findings with respect to each significant effect:

(1) Changes or alterations have been required in, or incorporated into, the project which mitigate or avoid the significant effects on the environment.

(2) Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency.

(3) Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the environmental impact report.

(b) With respect to significant effects, which were subject to a finding under paragraph (3) of subdivision (a), the public agency finds that specific overriding economic, legal, social, technological, or other benefits of the project outweigh the significant effects on the environment.

(Pub. Resources Code § 21081; see also, Cal. Code Regs., tit. 20, § 1755.)

### **SIGNIFICANT PROJECT IMPACTS**

In this Decision, we find that, like the permitted Palen Solar Power Plant (PSPP), the PSEGS and, to a lesser extent the Reduced Acreage Alternative with Solar Power Tower Technology, will result in significant environmental impacts that cannot be mitigated for visual resources and cultural resources. Unlike the PSPP, we have also found that the PSEGS and the Reduced Acreage

Alternative project with Solar Power Tower Technology would very likely result in significant and unmitigable impacts to biological resources, mainly due to the Solar Power Tower Technology's introduction of solar flux danger to avian species. These impacts cannot be avoided or substantially lessened through feasible mitigation measures or project alternatives. These significant impacts of the Reduced Acreage Alternative are more specifically described immediately below.

### **Cultural Resources**

The construction and operation of the Reduced Acreage Alternative will result in a significant direct and cumulative impact on the Chuckwalla Valley portion of the Pacific to Rio Grande Trails Landscape (PRGTL), a historical resource. This proposed Decision would require mitigation that would mitigate these impacts to the extent feasible, but would not avoid such impacts or reduce them to a level that is less than significant. (PMPD, **CULTURAL RESOURCES** section, p. 6.3-52; Findings of Fact 21, 23, and 24.) The Reduced Acreage Alternative may also permanently change and/or result in the destruction of cultural resources both known, and as yet unknown, contributing to a cumulatively considerable impact that will be mitigated to the extent feasible, but may remain significant after such mitigation. (PMPD, **CULTURAL RESOURCES** section, p. 6.3-60; Findings of Fact 19 and 28.) The project would also result in significant cumulative impacts, principally to the Chuckwalla Valley portion of the PRGTL and the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (DTCCCL), but also to other potential individual cultural resources. The Proposed Decision would mitigate such impacts to the extent feasible, but the remaining impacts may not be fully mitigated. (PMPD, **CULTURAL RESOURCES** section, p. 6.3-61; Findings of Fact 35 and 26.) The PSEGS project's direct and cumulative impacts to cultural resources are borne disproportionately by Native Americans. (PMPD, **CULTURAL RESOURCES** section, p. 6.3-61; Finding of Fact 31.)

### **Visual Resources**

The Reduced Acreage Alternative includes a 750-foot-tall solar tower topped by a 130-foot-tall solar receiver steam generator (SRSG) that would be the focal point of the concentrated sunlight reflected by 85,000 heliostats. The SRSG will absorb the concentrated sunlight to create steam, but will also act as an extremely bright source of light. The project would be prominently visible from two wilderness areas and the introduction of glare, industrial character, and structural visual contrast would result in a significant impact on KOPs 5 and 6, as well as KOPs 1, 2, 3, 4, 5, and 6. (PMPD, **VISUAL RESOURCES** section, p. 7.5-8; Findings of Fact 8, 10, 13, and 14.) The SRSG brightness will be very high dominating the landscape when in the field of view demanding viewers' attention

and exhibiting high levels of visual contrast to distances of 10 miles or greater, resulting in a significant adverse visual impact. There appear to be no feasible measures that would mitigate this significant impact. (PMPD, **VISUAL RESOURCES** section, pp. 7.5-12 – 7.5-13; Finding of Fact 10.) The Reduced Acreage Alternative's contribution to the visible industrialization of the desert landscape will be cumulatively considerable and constitute a significant visual impact when considered with future foreseeable projects, both within the project view-shed and in a broader context that encompasses the whole of the California Desert Conservation Area (CDCA). (PMPD, **VISUAL RESOURCES** section, p. 17; Finding of Fact 15.)

### **Biological Resources**

The Reduced Acreage Alternative may result in significant direct impacts to avian, bat, and invertebrate species due to the power tower's solar flux fields, which may not be mitigated to levels of less than significance considering the uncertainty surrounding impacts, the effectiveness of deterrent methods, and the resulting mitigation efforts. (PMPD, **BIOLOGICAL RESOURCES** section, p. 6.1-86; Findings of Fact 45, 48, 59, 65, and 66.) The project's contribution to significant cumulative effects to all avian species (resident and migratory birds) is cumulatively considerable when combined with the anticipated indirect effects to remaining habitat and populations. Anticipated direct and indirect effects may remain cumulatively considerable even with the application of mitigation. (PMPD, **BIOLOGICAL RESOURCES** section, p. 6.1-94; Findings of Fact 49, 51, 69, and 70.)

### **PROJECT BENEFITS**

Producing electricity from renewable resources provides a number of significant benefits to California's environment and economy, including improving local air quality and public health, reducing global warming emissions, developing local energy sources and diversifying our energy supply, improving energy security, enhancing economic development and creating green jobs. (2009 CEC Integrated Energy Policy Report, page 231.) The Reduced Acreage Alternative would provide these economic, social, technological, and other benefits to California.

### **Renewable Energy**

The principal goal of electric and natural-gas utilities' resource planning and investment is the minimization of the cost to society of the reliable energy services that are provided by natural gas and electricity, and to improve the environment and to encourage the diversity of energy sources through

improvements in energy efficiency and development of renewable energy resources. (Pub. Resources Code § 25000.1.)

The underlying purpose of the PSEGS and the Reduced Acreage Alternative we propose to license in this Decision is to implement California's Renewables Portfolio Standard (RPS) program, which was established in 2002 under Senate Bill (SB) 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB X 1-2. The RPS program requires each retail seller of electricity and publicly-owned electric utility to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020. (Pub. Resources Code § 25740, et seq.) Specifically, the RPS separates the required increase into three compliance periods. Between January 1, 2012, and December 31, 2013, each retail seller of electricity and each publicly-owned electric utility must procure 20 percent of its retail sales from eligible renewable resources. After that, each retail seller and publicly-owned electric utility must increase its annual procurement of renewable electricity to meet 25 percent of retail sales by December 31, 2016, and 33 percent of retail sales by December 31, 2020. (California Public Utilities Code §§ 399.15 & 399.30.) The RPS, therefore, back-loads the ramp-up in renewable procurement requiring an increase of 8 percent over the course of the four years of the third compliance period. The California Public Utilities Commission (CPUC) and the Energy Commission are jointly responsible for implementing the program. The importance of achieving these renewable energy goals was emphasized with the enactment of Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, which sets aggressive greenhouse gas (GHG) reduction goals for the state. (Ex. 2000, p. 6.1-4.)

Among a wide variety of strategic actions designed to attain the goals of AB 32, the California Air Resources Board approved a scoping plan that includes a 33 percent renewables portfolio standard (RPS), aggressive energy efficiency targets, and a cap-and-trade program that includes the electricity sector. The PSEGS project is expected to contribute to this goal. (Ex. 2000, pp. 4.1-93 – 4.1-95.)

The Reduced Acreage Alternative promotes the state's efforts to move towards a high-renewable, low-GHG electricity system and, therefore, reduces both the amount of natural gas used by electricity generation and GHG emissions. It does this in several ways. First, California's Energy Action Plan (EAP) Loading Order specifies that electrical energy demand be met first by energy efficiency and demand response, followed by employing renewable energy such as would be provided by Reduced Acreage Alternative. Secondly, the energy produced by the Reduced Acreage Alternative would displace energy from higher GHG-emitting coal- and natural-gas-fired generation resources, lowering the GHG emissions

from the western United States, the relevant geographic area for the discussion of GHG emissions from electricity generation. Finally, the dependable capacity provided by the Reduced Acreage Alternative would facilitate the retirement and/or divestiture of resources that cannot meet the Emissions Performance Standard (EPS) or are adversely affected by the SWRCB's policy on once-through cooling. (Ex. 2000, p. 4.1-100.)

While the Reduced Acreage Alternative would combust some natural gas and thus emit GHGs as part of its operations, it would produce substantially fewer GHG emissions (emitting approximately 132 lbs. CO<sub>2</sub>/MWh) than the coal- and natural-gas-fired resources it would displace. Coal-fired generation requires the combustion of 9,000 – 10,000 Btu/MWh, resulting in more than 1,800 lbs. CO<sub>2</sub>/MWh. Natural-gas-fired generation in California requires an average of 8,566 Btu/MWh, yielding approximately 1,000 lbs. CO<sub>2</sub>/MWh. California would benefit from the Reduced Acreage Alternative's substantial displacement and reduction of CO<sub>2</sub>. (Ex. 2000, p. 4.1-102.)

By generating electricity with the use of a substantially reduced amount of fossil fuels, the Reduced Acreage Alternative would decrease California's dependence on fossil fuels, a diminishing energy source, as well as indirectly reduce criteria pollutant emissions within the Western U.S. and part of Canada and Mexico by reducing fossil-fuel-fired electricity generation. (Ex. 2000, p. 4.1-41.)

### **Actual Renewable Delivery**

The evidence shows that the Reduced Acreage Alternative project construction would take 28 months and begin in 2015. (7/30/14 RT 33:13 -20; Exs. 1166, pp. 1 - 3; 1167.) The factual underpinnings for the schedule of additional approvals that apply to PSEGS would similarly apply to the Reduced Acreage Alternative this proposed Decision would approve. Uncontroverted evidence established that the PSEGS project has an approved Power Purchase Agreement (PPA) and a Large Generator Interconnection Agreement (LGIA), both of which are specific to the power tower technology. (Ex. 1124.) The commercial operation date in the PSEGS PPA is July 2017. (Ex. 1151.) PSEGS has a Final Determination of Compliance from SCAQMD (Ex. 2016). The BLM is considering the PSEGS' Right of Way (ROW) application and revised Plan of Development (POD) and has published a draft (Supplemental Environmental Impact Study) SEIS for the project. (Ex. 2000, p. 6.1-29.) All of these permits are only issued after a protracted application process at great expense to the applicant. (Ex. 1124, p. 2.) Expert testimony established that the process of power plant construction takes five to eight years. (7/30/14 RT 83:4 – 21.) From this evidence, it is reasonable to infer that power plant projects that are not already on their way to obtaining

necessary permits will likely not be operational by 2020 to meet the RPS deadline. Petitioner noted that renewable projects that can make up for the loss of San Onofre Nuclear Generating Station and supplement once-through cooling repowers are needed now, not eight years from now. (7/30/14 RT 83:22 – 84:8.)

The benefit that the Reduced Acreage Alternative offers is that it has nearly completed the various licensing and transmission interconnection application processes such that commencement of construction is within reach. If the alternative project meets the terms of its PPA and begins commercial operation by July 2017, it will provide renewable energy throughout the majority of the third compliance period and, therefore, contribute meaningfully to the statewide increase from 25 percent to 33 percent renewable energy from January 1, 2017, to December 31, 2020. We find that California is better served by a facility that can be constructed and operational in time to help the state achieve this ramp-up in renewable energy procurement, rather than hypothetical projects which, even if constructed, would likely not be operational until well after the state has passed the deadline to achieve its 33 percent RPS goal.

### **Technological Benefits**

#### Portfolio Diversity

California is best served by a rich diversity of renewable energy supply. California seeks to encourage the diversity of energy sources through improvements in energy efficiency and development of renewable energy resources. (Pub. Resources Code § 25000.1.)

The Reduced Acreage Alternative will improve that diversity. The Chuckwalla Valley is indicative of the kind of diversity California needs. It already has a power plant that utilizes the trough technology, i.e., the Genesis Solar Energy Project (GSEP) approximately 12 miles east of the PSEGS site in the Riverside East SEZ. (Ex. 2000, p. 6.1-27.) There are at least three large scale photovoltaic (PV) solar projects approved for the Chuckwalla Valley, namely Desert Sunlight Solar Farm Project, the McCoy Solar Energy Project, and the Blythe Solar Power Project. (Ex. 2000, pp. 6.1-52 – 6.1-53.)

The Reduced Acreage Alternative would be the first project to utilize the power tower technology in the Chuckwalla Valley. In light of the policy favoring a diversity of renewable energy supply, we find that the state would benefit from the unique attributes of the Reduced Acreage Alternative, including the easy adaptability of thermal energy storage discussed more fully below.

## Thermal Energy Storage

Public Utilities Code section 2837 articulates the following benefits in requiring the CPUC to set procurement targets for energy storage in the state:

1. Integrate intermittent generation from eligible renewable energy resources into the reliable operation of the transmission and distribution grid;
2. Allow intermittent generation from eligible renewable energy resources to operate at or near full capacity;
3. Reduce the need for new fossil-fuel-powered peaking generation facilities by using stored electricity to meet peak demand;
4. Reduce purchases of electricity generation sources with higher emissions of greenhouse gases;
5. Eliminate or reduce transmission and distribution losses, including increased losses during periods of congestion on the grid;
6. Reduce the demand for electricity during peak periods and achieve permanent load-shifting by using thermal storage to meet air-conditioning needs;
7. Avoid or delay investments in transmission and distribution system upgrades; and
8. Use energy storage systems to provide the ancillary services otherwise provided by fossil-fueled generating facilities.

The testimony adduced at the evidentiary hearing established that the proposed project had “plug and play capability to put thermal storage into the project.” (7/30/14 RT 50:12-18.) While other solar thermal technologies can accommodate storage, the power tower technology delivers superior performance more cost effectively with fewer constraints, due largely to the higher operating temperature of the power tower technology. (7/30/14 RT 167:3-172:19.) While thermal energy storage is not proposed by the Petitioner at this time, we find that the ease of incorporating thermal energy storage into the project is an important, current, and real benefit to the State of California that the Reduced Acreage Alternative project confers. Concentrated solar power more efficiently accommodates thermal energy storage than other solar energy technologies. The Solar Power Tower Technology generates higher temperatures (three times higher than trough), which allows for more efficient and more cost effective energy storage than trough or PV technologies. (Ex. 1206; 7/30/14 RT167:10-25; 172:2-18; 208:5-23.) This capability constitutes an important potential, and a benefit for California’s energy future.

## **Social Benefits**

There are other power plants using the power tower technology in California, such as the Ivanpah Solar Electric Generating System (ISEGS) and throughout the world. Solar power towers are being designed to provide baseload power; that is, to continuously operate for 24 hours a day using thermal energy storage. (7/30/14 RT 210:17 - 211:24.) While thermal energy storage in general is important to supply energy needs, the potential for renewable baseload generation would represent a major leap forward for renewable energy production. Today, existing solar power production is restricted by the amount of available daylight. The technology utilized by the Reduced Acreage Alternative project has the potential to evolve toward the realization of large scale renewable baseload that could conceivably replace even natural-gas facilities. (7/30/14/ RT 209:8 – 210:10.) The people of California and beyond have a vital interest in the acceleration of that evolution.

## **Economic Benefits**

The Reduced Acreage Alternative would provide construction jobs for an average and peak workforce of 603 and 1,241, respectively. (Ex. 1168.) The construction work force is expected to be drawn from the Riverside/San Bernardino County region. Most of those jobs would require highly-trained workers. (PMPD, **SOCIOECONOMICS** section, pp. 7.3-1; 7.3-23.)

Construction of solar tower technology will provide more hours of construction than trough or PV technology. Solar tower technology requires the broadest range of skills and construction workers from nearly every type of construction union. Solar tower technology provides more and better apprentice training opportunities than any other solar technology. (Ex. 6000.)

Construction and operation of the Reduced Acreage Alternative would provide a boost to the economy from the purchase of major equipment, payroll, and supplies, increased sales tax revenue, and property taxes. Additional indirect economic benefits, such as employment in local service industry jobs and induced employment, would result from these expenditures as well. (PMPD, **SOCIOECONOMICS** section, p. 7.3-54 – 7.3-55.)

## **Conclusion**

We find that the benefits of the project discussed above outweigh the significant impacts that would result from the construction and operation of the Reduced Acreage Alternative project. Therefore, the Petition to Amend the PSEGS project is **GRANTED**, but is limited to the Reduced Acreage Alternative with a single power tower.

## **COMPARISON OF PROJECT ALTERNATIVES**

As explained in more detail in the **ALTERNATIVES** section of this Decision, we find that specific economic, legal, social, technological, and other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the no-project (PSPP) and PV alternatives.

We have found that the Reduced Acreage Alternative with a single solar power tower is a feasible and superior alternative. The Reduced Acreage Alternative with a single solar power tower is consistent with the Petitioner's Phasing Plan and provides an opportunity to learn about the impacts and mitigation of solar flux effects with one tower instead of two. (Exs.1166, 1167.) Staff testified that the Reduced Acreage Alternative with a single solar power tower would reduce the impacts to biological resources much more than it would reduce the impacts to visual or cultural resources. (Ex. 1206.) Further, the Reduced Acreage Alternative with a single solar power tower can be upgraded to add thermal energy storage. (7/30/14 RT 50:12-18.) Staff concurred with Petitioner that no further analysis is necessary and that the change to the Reduced Acreage Alternative with a single solar power tower project would either have a beneficial effect or no additional effect at all. (7/30/14 RT 29:19 – 34:20.) In light of all of these considerations and the evidence presented, we will certify the Reduced Acreage Alternative with a single power tower.

## **SITE CHARACTERISTICS**

The Chuckwalla Valley is mostly characterized by undisturbed desert open space and wilderness, distinctive flora such as creosote bush scrub and Joshua tree, sand dunes, and mountainous terrain with large rock outcroppings. Urban and suburban development is largely absent and infrastructure other than energy transmission infrastructure is very limited. The project site is adjacent to, and in the vicinity of Interstate 10 (I-10), the Red Bluff Substation and existing electricity infrastructure, including major transmission lines and other built and proposed solar power projects, including the Genesis Solar Energy Project and Desert Sunlight Solar Farm. (PMPD, **LAND USE** section, pp. 7.1-7 – 7.1-10.)

## **OFFICIAL NOTICE**

In arriving at the following findings, we have taken official notice of the following documents:

- 2009 Integrated Energy Policy Report. CEC. Nov. 2009
- 2011 Integrated Energy Policy Report. CEC. Nov. 2011
- 2013 Integrated Energy Policy Report. CEC. Nov. 2013

## **CEQA OVERRIDE FINDING**

As discussed above, the Reduced Acreage Alternative would reduce project impacts, but such impacts are nevertheless significant even after feasible mitigation is required. Such impacts are the direct, indirect, and cumulative impacts previously discussed in the **BIOLOGICAL RESOURCES, CULTURAL RESOURCES,** and **VISUAL RESOURCES** sections of this Decision. The alternative project we license with this amendment is for one power tower rather than the requested two towers. The evidence is undisputed that this smaller project will reduce impacts by reducing the project imprint, reducing the solar flux field that causes significant impacts to flying fauna, and reducing the degree of the visual effect, with lower attendant impacts to the cultural resources previously described.

The residual environmental impacts in each of these areas remain significant, and there is no feasible mitigation that can reduce such impacts to a level that is less than significant. However, we have discussed above the various project advantages that compel us to find that the remaining unavoidable impacts are acceptable due to these overriding advantages. We thus propose to license the Reduced Acreage Alternative project despite the unavoidable environmental consequences.

## **FINDINGS OF FACT**

Based on the evidence and the conclusions drawn in other sections of this Decision, we make the following findings and conclusions:

1. Climate change poses a serious threat to the economic well-being, public health, natural resources, and the environment of California.
2. The proposed project will have the following impacts that cannot be mitigated to insignificant levels:
  - A. *Impacts to Visual Resources:* The Reduced Acreage Alternative will include a 750-foot-tall solar tower topped by a 130-foot-tall SRSG that is the focal point of the concentrated sunlight reflected by 85,000 heliostats, constituting an extremely bright source of light. The project will be prominently visible from two wilderness areas and the introduction of glare, industrial character, and structural visual contrast will result in a significant visual impact demanding viewers' attention and exhibiting high levels of visual contrast to distances of 10 miles or greater. There appear to be no feasible measures that would mitigate this significant impact. The contribution of the Reduced Acreage Alternative to the visible industrialization of the desert landscape will be a significant direct and cumulative impact, both within the project viewshed and

in a broader context that encompasses the whole of the California Desert Conservation Area (CDCA).

- B. *Impacts to Biological Resources*: The Reduced Acreage Alternative may result in significant direct impacts to avian, bat, and invertebrate species due to the power towers' solar flux fields, which will be mitigated to the extent possible, but may not be fully mitigated. The project's cumulative impact to all avian species (resident and migratory birds) is significant when combined with the anticipated indirect effects to remaining habitat and populations. Anticipated direct and indirect effects may remain significant even with the application of the feasible mitigation required in this decision.
  - C. *Impacts to Cultural Resources*: The Reduced Acreage Alternative project will result in a significant direct and cumulative impact on the Chuckwalla Valley portion of the PRGTL, a historical resource, which will be mitigated to the extent possible, but may not be fully mitigated. The project may also permanently change and/or result in the destruction of cultural resources, both known, and as yet unknown, contributing to a significant cumulative impact, which will be mitigated to the extent possible, but which may not be fully mitigated. The project will also result in significant cumulative impacts principally to the Chuckwalla Valley portion of the DTCCL, among other potential individual cultural resources, which will be mitigated to the extent possible, but which may not be fully mitigated.
3. The Reduced Acreage Alternative project's direct and cumulative impacts to cultural resources will disproportionately affect Native Americans.
  4. This Decision will result in mitigation of all direct and indirect project impacts from PSEGS, except to biological resources, visual, and cultural resources as noted above, and imposes feasible mitigation measures to reduce the significant direct impacts of the project to below a level of significance.
  5. This Decision requires mitigation for all direct and cumulative project impacts that will result from the Reduced Acreage Alternative. Such mitigation will avoid or reduce in variable degree project impacts. However, these impacts remain, or may remain significant even after the imposition of all such mitigation.
  6. The only feasible project alternative that would lessen the direct and cumulative impacts to biological resources, visual resources, and cultural resources, is the Reduced Acreage Alternative with a single solar power tower.
  7. The Reduced Acreage Alternative project will provide the following benefits:

- A. Timely contribute to California's renewable energy and greenhouse gas emission reduction goals.
- B. Promotes the state's efforts to move towards a high-renewable, low-GHG electricity system and, therefore, reduces both the amount of natural gas used by electricity generation and GHG emissions.
- C. Facilitate the retirement and/or divestiture of resources that cannot meet the Emissions Performance Standard (EPS) or are listed for closure or modification by the SWRCB's policy on once-through cooling.
- D. Contribute meaningfully to the statewide increase from 25 percent to 33 percent renewable energy from January 1, 2017, to December 31, 2020.
- E. Provide the possibility for incorporating thermal energy storage into the PSEGS' Reduced Acreage Alternative with a single solar power tower.
- F. Provide construction jobs for an average and peak workforce of 603 and 1,241, respectively.
- G. Provide more hours of construction than trough or PV technology.
- H. Requires the broadest range of skills and construction workers from nearly every type of construction union.
- I. Provide a boost to the economy from the purchase of major equipment, payroll, and supplies, increased sales tax revenue, and property taxes.
- J. Specific economic, legal, social, technological, and other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the no-project (PSPP) and PV alternatives.

## **CONCLUSION OF LAW**

The Reduced Acreage Alternative project has benefits that outweigh and override the significant direct and cumulative impacts specifically identified in the discussions above.

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Appendix A: *Laws, Ordinances,  
Regulations, and  
Standards*

Appendix B: *Exhibit List*

Appendix C: *Proof of Service List*



# ***APPENDICES***

**AIR QUALITY**  
**Laws, Ordinances, Regulations, and Standards**

Applicable LORS	Description
<b>Federal</b>	
40 Code of Federal Regulations (CFR) Part 52	<p>Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and Offsets. Permitting and enforcement delegated to South Coast Air Quality Management District (SCAQMD).</p> <p>Prevention of Significant Deterioration (PSD) requires major sources or major modifications to major sources to obtain permits for attainment pollutants. The PSEGS is a new source that does not have a rule listed emission source thus the PSD trigger levels are 250 tons per year for NOx, VOC, SO2, PM2.5 and CO.</p>
40 CFR Part 60	<p>New Source Performance Standards (NSPS), Subpart Db, Dc Standards of Performance for Small Industrial-Commercial-Institutional Steam Generation Units. Establishes recordkeeping and reporting requirements for natural gas fired steam generating units.</p> <p>Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Establishes emission standards for compressions ignition internal combustion engines, including emergency generator and fire water pump engines.</p>
40 CFR Part 93 General Conformity	Requires determination of conformity with State Implementation Plan for projects requiring federal approvals if project annual emissions are above specified levels.
40 CFR, Part 63	National Emissions Standards for Hazardous Air Pollutants (NESHAPS)
<b>State</b>	
Health and Safety Code Section 40910-40930	Permitting of source needs to be consistent with California Air Resource Board (ARB) approved Clean Air Plans.
Health and Safety Code Section 41700	Restricts emissions that would cause nuisance or injury.
California Code of Regulations Section 93115	Airborne Toxics Control Measure for Stationary Compression Ignition Engines. Limits the types of fuels allowed, established maximum emission rates, establishes recordkeeping requirements on stationary compression ignition engines, including emergency generator and fire water pump engines.
California Code of Regulations, Title13 , section 2423	Exhaust Emission Standards and Test Procedures: Heavy-Duty Off-Road Diesel Cycle Engines. Limits the tier levels of emissions from heavy-duty off-road diesel cycle engines, including emergency backup generators and emergency firewater pump engines.
<b>Local (South Coast Air Quality Management District)</b>	
Rules 201, 203, and 212 – Permit to Construct, Permit to Operate, and Standards for Approving Permits and Issuing Public Notice	Establishes the requirements to obtain a Permit to Construct and Permit to Operate for emission sources.
Rule 401 – Visible Emissions	Limits visible emissions.

<b>Applicable LORS</b>	<b>Description</b>
Rule 402 – Nuisance	Prohibits the discharge of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to the public or which endanger the comfort, response, health or safety of the public or which cause injury or damage to business or property.
Rule 403 – Fugitive Dust	Limits fugitive emissions from certain bulk storage, earthmoving, construction and demolition, and manmade conditions that may cause wind erosion.
Rule 404 – Particulate Matter Concentration	The rule limits particulate matter (PM) emissions. PM emission limits included in the rule are functions of the exhaust flow rate from the regulated device.
Rule 409 – Combustion Contaminants	Limits combustion contaminant discharge into the atmosphere from fuel burning equipment to 0.1 grain or less per cubic foot of gas calculated to 12% of carbon dioxide (CO <sub>2</sub> ) at standard conditions.
Rule 429 – NO <sub>x</sub> Exemptions for Startup/Shutdown	Provides NO <sub>x</sub> emission exemptions for boiler subject to Rule 1146 for periods of startup and shutdown.
Rule 431.1 – Sulfur Compounds of Gaseous Fuels	Limits discharge into the atmosphere of sulfur compounds from the burning of gaseous fuels.
Rule 431.2 – Sulfur Compounds of Liquid Fuels	Limits discharge into the atmosphere of sulfur compounds from the burning of liquid fuels.
Rule 463 – Organic Liquids Storage	Sets standards for storage of organic liquids with a true vapor pressure of 0.5 pounds per square inch or greater.
Rule 474–Fuel Burning Equipment–Oxides of Nitrogen	Limits the discharge of NO <sub>2</sub> to the atmosphere to the concentrations specified in the rule.
Regulation IX – New Source Performance Standard	Incorporates the Federal NSPS (Title 40 CFR 60) rules by reference.
Rule 1110.2 – Emissions From Gaseous and Liquid-Fueled Internal Combustion Engines	The purpose of this rule is to reduce NO <sub>x</sub> , VOCs, and CO from engines.
Rule 1121 – NO <sub>x</sub> Control from NG Fired Water Heaters	Limits NO <sub>x</sub> emissions from natural gas fired residential type water heaters and would apply to the administration building.
Rule 1146 – Emissions of Oxides of Nitrogen from Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters	This rule limits NO <sub>x</sub> emissions from boilers, steam generators, and process heaters.
Rule 1166 – VOC Emissions from Decontamination of Soil	Establishes requirements to control VOC emissions from handling of VOC-contaminated soil.
Regulation XIII – New Source Review	Establishes the pre-construction review requirements, including Best Available Control Technology and emission offset requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards.

**GREENHOUSE GAS**  
**Laws, Ordinances, Regulations, and Standards (LORS)**

Applicable LORS	Description
<b>Federal</b>	
40 Code of Federal Regulations (CFR) Parts 51, 52, 70 and 71	This rule “tailors” GHG emissions to PSD and Title V permitting applicability criteria.
40 Code of Federal Regulations (CFR) Parts 51 and 52	A new stationary source that emits more than 100,000 TPY of GHGs is considered to be a major stationary source subject to Prevention of Significant Determination (PSD) requirements. This project would not trigger this 100,000 TPY PSD threshold.
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO <sub>2</sub> equivalent emissions per year. This requirement is triggered by this project.
<b>State</b>	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	This act requires the California Air Resource Board (ARB) to enact standards to reduce GHG emission to 1990 levels by 2020. Electricity production facilities will be regulated by the ARB. A cap-and-trade program became active in January 2012, with enforcement beginning in January 2013. Cap-and-trade is expected to achieve approximately 20 percent of the GHG reductions expected under AB 32 by 2020.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009 (also known as SB 1368)	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 MTCO <sub>2</sub> /MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO <sub>2</sub> /MWh).

## BIOLOGICAL RESOURCES

Applicable LORS	Description
<b>Federal</b>	
Federal Endangered Species Act (Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and protects federally threatened and endangered plants and animals and their critical habitats.
Clean Water Act (Title 33, United States Code, sections 1251 through 1376, and Code of Federal Regulations, part 30, section 330.5(a)(26))	Requires the permitting and monitoring of all discharges to surface water bodies. Section 404 requires a permit from the U.S. Army Corps of Engineers (USACE) for a discharge of dredged or fill materials into waters of the U.S., including wetlands. Section 401 requires a permit from a regional water quality control board (RWQCB) for the discharge of pollutants. By federal law, every applicant for a federal permit or license for an activity that may result in a discharge into a California water body, including wetlands, must request state certification that the proposed activity will not violate state and federal water quality standards.
Eagle Act (Title 50, Code of Federal Regulations, section 22.26)	Would authorize limited take of bald eagles ( <i>Haliaeetus leucocephalus</i> ) and golden eagles ( <i>Aquila chrysaetos</i> ) under the Eagle Act, where the taking is associated with, but not the purpose of activity, and cannot practicably be avoided.
Eagle Act (Title 50, Code of Federal Regulations, section 22.27)	Would provide for the intentional take of eagle nests where necessary to alleviate a safety hazard to people or eagles; necessary to ensure public health and safety; the nest prevents the use of a human-engineered structure; or the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests would be allowed to be taken except in the case of safety emergencies.
Bald and Golden Eagle Protection Act (Title 16, United States Code section 668)	This law provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the take, possession, and commerce of such birds. The 1972 amendments increased penalties for violating provisions of the Act or regulations issued pursuant thereto and strengthened other enforcement measures. Rewards are provided for information leading to arrest and conviction for violation of the Act.
California Desert Conservation Area (CDCA) Plan	The California Desert Conservation Area (CDCA) Plan was established by Congress at the time of the passage of the Federal Land and Policy Management Act (FLPMA). The FLPMA outlines how the BLM will manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan.
Northern and Eastern Colorado Desert Coordinated Management Plan (NECO)	A regional amendment to the CDCA Plan approved in 2002, NECO protects and conserves natural resources while simultaneously balancing human uses in the northern and eastern portion of the Colorado Desert.
Migratory Bird Treaty Act (Title 16, United States Code, sections 703 through 711)	Makes it unlawful to take or possess any migratory nongame bird (or any part of such migratory nongame bird) as designated in the Migratory Bird Treaty Act.
Executive Order 11312	Prevent and control invasive species.

<b>Applicable LORS</b>	<b>Description</b>
Wild Free-Roaming Horse and Burro Act (Public Law 92-195)	Wild horses and burros are protected from capture, branding, harassment, and death, and managed with the intent to achieve and preserve the natural ecological balance on public lands.
Desert Tortoise (Mojave Population) Recovery Plan (USFWS 2011)	Describes a strategy for recovery and delisting of the desert tortoise.
<b>State</b>	
California Endangered Species Act of 1984 (Fish and Game Code, sections 2050 through 2098)	Protects California's rare, threatened, and endangered species.
Protected furbearing mammals (California Code of Regulations, Title 14, section 460)	Fisher, marten, river otter, desert kit fox, and red fox may not be taken at any time.
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain species as fully protected and prohibits the take of such species or their habitat unless for scientific purposes (see also California Code of Regulations Title 14, section 670.7).
Nest or Eggs (Fish and Game Code section 3503)	Protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by code or regulation.
Birds of Prey (Fish and Game Code section 3503.5)	Unlawful to take, possess, or destroy any birds in the orders Falconiformes and Strigiformes or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by code or regulation.
Migratory Birds (Fish and Game Code section 3513)	Protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame birds except as otherwise provided by code or regulation.
Nongame mammals (Fish and Game Code section 4150)	Makes it unlawful to take or possess any non-game mammal or parts thereof except as provided in the Fish and Game Code or in accordance with regulations adopted by the commission.
Significant Natural Areas (Fish and Game Code section 1930 and following)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.
California Environmental Quality Act (CEQA), CEQA Guidelines section 15380	CEQA defines rare species more broadly than the definitions for species listed under the state and federal endangered species acts. Under section 15830, species not protected through state or federal listing but nonetheless demonstrable as "endangered" or "rare" under CEQA should also receive consideration in environmental analyses. Included in this category are many plants considered rare by the California Native Plant Society (CNPS) and some animals on the CDFW's Special Animals List.

<b>Applicable LORS</b>	<b>Description</b>
Streambed Alteration Agreement (Fish and Game Code sections 1600 and following)	Regulates activities that may divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake in California designated by CDFW in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit. Impacts to vegetation and wildlife resulting from disturbances to waterways are also reviewed and regulated during the permitting process.
California Native Plant Protection Act of 1977 (Fish and Game Code section 1900 and following)	Designates state rare, threatened, and endangered plants.
California Desert Native Plants Act of 1981 (Food and Agricultural Code section 80001 and following and California Fish and Game Code sections 1925-1926)	Protects non-listed California desert native plants from unlawful harvesting on both public and private lands in Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego Counties. Unless issued a valid permit, wood receipt, tag, and seal by the commissioner or sheriff, harvesting, transporting, selling, or possessing specific desert plants is prohibited.
Porter-Cologne Water Quality Control Act	Regulates discharges of waste and fill material to waters of the state, including "isolated" waters and wetlands.

## CULTURAL RESOURCES

### Laws, Ordinances, Regulations, and Standards

Applicable LORS	Description
<b>Federal</b>	
BLM-Cal SHPO-Project Owner Programmatic Agreement (PA)	Instrument adopted in 2010 (amended in 2013) between the BLM, the California State Historic Preservation Officer (SHPO), and Palen Solar I, LLC (owner) outlining protocols and obligations for treatment of historic and cultural resources on the PSCP, and coordination for compliance with Section 106 of the National Historic Preservation Act (NHPA).
<b>State</b>	
Government Code, section 62544.10 – California Public Records Act	Provides for non-disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of, the Department of Parks and Recreation, the State Historical Resources Commission, the State Lands Commission, the Native American Heritage Commission, another state agency, or a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency.
<b>Local</b>	
Riverside County General Plan, Multipurpose Open Space Element, Policies O.S. 19.2-19.4	OS 19.2 requires that review of all proposed development for archaeological sensitivity; OS 19.3 employs procedures to protect the confidentiality and prevent inappropriate public exposure of sensitive archaeological resources when soliciting the assistance of public and volunteer organizations. OS 19.4 requires a Native American Statement as part of the environmental review process on development projects with identified cultural resources.
Riverside County General Plan, Multipurpose Open Space Element, Policies O.S. 19.5-19.7	OS 19.5 allows the History Division of the Riverside County Regional Park and Open Space District to evaluate large project proposals for their potential preservation or destruction of historic sites; requires projects to provide feasible mitigation for impacts to historic sites prior to county approval. OS 19.6 enforces the California State Historic Building Code so that historic buildings can be preserved and used without posing a hazard to public safety. OS 19.7 endorses the allocation of resources and/or tax credits to prioritize retrofit of historic structures.
Riverside County General Plan, Exhibit A, CEQA Findings of Fact and Statement of Overriding Considerations, Section 4.7, Mitigation Monitoring Program, Measures 4.7.1A, 4.7.1B, and 4.7.1C.	Outlines mitigation measures for cultural resources monitoring programs.

## POWER PLANT EFFICIENCY

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the efficiency of this project.

## FACILITY DESIGN

Applicable LORS	Description
<b>Federal</b>	
Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
<b>State</b>	
2010 (or latest edition) California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)	2010 (or latest edition) California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
<b>Local</b>	
<b>Riverside County</b>	
Riverside County regulations and ordinances	Riverside County regulations and ordinances
<b>General</b>	
	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

## GEOLOGY AND PALEONTOLOGY

Applicable LORS	Description
<b>Federal</b>	
Antiquities Act of 1906 (16 United States Code [USC], 431-433)	The proposed PSEGS facility site is located entirely on land currently administered by the Bureau of Land Management (BLM). Although there is no specific mention of natural or paleontologic resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR Part 3], 'objects of antiquity' has been interpreted to include fossils by the Federal Highways Act of 1956, the National Park Service (NPS), the BLM, the Forest Service (USFS), and other Federal agencies.

<b>Applicable LORS</b>	<b>Description</b>
Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701-1784)	Mandates that the BLM manage public lands under the principles of multiple use and sustained yield unless otherwise specified by law, and to protect the quality scientific, scenic, historical, archeological, and other values, and to develop 'regulations and plans for the protection of public land areas of critical environmental concern', which include 'important historic, cultural or scenic values'. Also charged with the protection of 'life and safety from natural hazards'.
Paleontologic Resources Preservation Act (PRPA) of 2009 (Public Law [PL] 111-011)	Authorizes Departments of Interior and Agriculture Secretaries to manage the protection of paleontologic resources on Federal lands.
National Historic Preservation Act of 1966 (NHPA) (16 USC 470)	Establishes policies for the 'preservation of the prehistoric and historic resources of the United States', under the direction of the Secretary of the Interior and the BLM.
<b>State</b>	
California Building Code (CBC), 2007	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control).
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), section 2621–2630	Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. Portions of the site and proposed ancillary facilities are located within designated Alquist-Priolo Fault Zones. The proposed site layout places occupied structures outside of the 50-foot setback zone.
The Seismic Hazards Mapping Act, PRC Section 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
Public Resources Code, Chapter 1.7, sections 5097.5 and 30244	Regulates removal of paleontologic resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
<b>Local</b>	
Riverside County General Plan 2000, Safety Element	Adopts the Uniform Building Code (UBC) (1997), which provides design criteria for buildings and excavations. The UBC is superseded by the CBC (2007). Requires mitigation measures for geologic hazards, including seismic shaking, surface rupture (adopts APEFZ Act), liquefaction, unstable soils and slopes, and flooding.
Riverside County General Plan 2000, Multipurpose Open Space Element	Provides for 'preservation of cultural, historical, archaeological, paleontologic, geologic and educational resources'. Also provides a map showing paleontologic sensitivity in the county.
<b>Standards</b>	

<b>Applicable LORS</b>	<b>Description</b>
Society for Vertebrate Paleontology (SVP), 2010	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 and revised in 2010 by the SVP, a national organization of professional scientists.
Bureau of Land Management (BLM) Instructional Memorandum 2008-009	Provides up-to-date methodologies for assessing paleontological sensitivity and management guidelines for paleontological resources on lands managed by the Bureau of Land Management.

## HAZARDOUS MATERIALS MANAGEMENT

<b>Applicable LORS</b>	<b>Description</b>
<b>Federal</b>	
The Superfund Amendments and Reauthorization Act of 1986 (42 USC §9601 et seq.)	Contains the Emergency Planning and Community Right To Know Act (also known as SARA Title III).
The Clean Air Act (CAA) of 1990 (42 USC 7401 et seq. as amended)	Established a nationwide emergency planning and response program and imposed reporting requirements for businesses that store, handle, or produce significant quantities of extremely hazardous materials.
The CAA section on risk management plans (42 USC §112(r))	Requires states to implement a comprehensive system informing local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of both SARA Title III and the CAA are reflected in the California Health and Safety Code, section 25531, et seq.
49 CFR 172.800	The U.S. Department of Transportation (DOT) requirement that suppliers of hazardous materials prepare and implement security plans.
49 CFR Part 1572, Subparts A and B	Requires suppliers of hazardous materials to ensure that all their hazardous materials drivers are in compliance with personnel background security checks.
The Clean Water Act (CWA) (40 CFR 112)	Aims to prevent the discharge or threat of discharge of oil into navigable waters or adjoining shorelines. Requires a written spill prevention, control, and countermeasures (SPCC) plan to be prepared for facilities that store oil that could leak into navigable waters.
Federal Register (6 CFR Part 27) interim final rule	A regulation of the U.S. Department of Homeland Security that requires facilities that use or store certain hazardous materials to submit information to the department so that a vulnerability assessment can be conducted to determine what certain specified security measures shall be implemented.
<b>State</b>	
Title 8, California Code of Regulations, section 5189	Requires facility owners to develop and implement effective safety management plans that ensure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the Risk Management Plan (RMP) process.

<b>Applicable LORS</b>	<b>Description</b>
California Health and Safety Code, section 41700	Requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)	Prevents certain chemicals that cause cancer and reproductive toxicity from being discharged into sources of drinking water.
Hazardous Material Business Plan, Cal Health and Safety Code Sections 25500 to 25541; California Code of Regulations, Title 19, Sections 2720 to 2734	Requires the submittal of a chemical inventory and planning and reporting for management of hazardous materials.
Hazardous Substance Information and Training Act, California Code of Regulations, Title 8, Section 339; Section 3200 et seq., 5139 et seq., and 5160 et seq.	Requires listing and implementation of specified control measures for management of hazardous substances.
California Health and Safety Code Sections 25270 through 25270.13	Requires the preparation of a Spill Prevention, Control, and Countermeasures (SPCC) Plan if 10,000 gallons or more of petroleum is stored on-site. The above regulations would also require the immediate reporting of a spill or release of 42 gallons or more to the California Office of Emergency Services and the Certified Unified Program Authority (CUPA).
NFPA 56 (adopted 2012)	NFPA 56 is the Standard for Fire and Explosion Prevention During Cleaning and Purging of Flammable Gas Piping Systems.
<b>Local</b>	
Riverside County Fire Code, Riverside County Code Chapter 8.32: Ordinance No. 787	Adopts the California Fire Code, 2007 Edition, with some of its appendices, into Riverside County regulations.
Disclosure of Hazardous Materials and the Formulation of Business Emergency Plans: Riverside County Ordinance 651	Requires disclosure where businesses handle hazardous materials and requires the development of response plans; designates Riverside County Department of Environmental Health as responsible for administration and enforcement of local codes.

## LAND USE

<u>Applicable LORS</u>	<u>Description</u>
<b>Federal</b>	
Federal Land Policy and Management Act (FLPMA), 1976 – 43 CFR 1600, Sec. 501. [43 U.S.C. 1761]	Establishes public land policy; guidelines for administration; and provides for the management, protection, development, and enhancement of public lands. In particular, the FLPMA's relevance to the proposed project is that Title V; Section 501 establishes BLM's authority to grant rights-of-way for generation, transmission, and distribution of electrical energy (FLPMA 2001).
Bureau of Land Management - California Desert Conservation Area (CDCA) Plan, 1980 as Amended (BLM 1980)	<p>The 25 million-acre CDCA contains over 12 million acres of public lands spread within the area known as the California Desert, which includes the following three deserts: the Mojave, the Sonoran, and a small portion of the Great Basin. The 12 million acres of public lands administered by the BLM are half of the CDCA.</p> <p>The CDCA Plan is a comprehensive, long-range plan with goals and specific actions for the management, use, development, and protection of the resources and public lands within the CDCA, and it is based on the concepts of multiple use, sustained yield, and maintenance of environmental quality. The plan's goals and actions for each resource are established in its 12 elements. Each of the plan elements provides both a desert-wide perspective of the planning decisions for one major resource or issue of public concern as well as more specific interpretation of multiple-use class guidelines for a given resource and its associated activities.</p>
Northern and Eastern Colorado Desert (NECO) Coordinated Management Plan	The NECO plan is a landscape-scale planning effort for most of the California portion of the Sonoran Desert ecosystem. The planning area encompasses over five million acres. The NECO Plan amended the CDCA plan in 2002. The CDCA Plan/NECO is related to the BLM/U.S. Department of Energy (DOE). Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States, which was published in July 2012. It gives guidance as to how and where solar projects can be built on BLM lands.

## NOISE

<b>Applicable LORS</b>	<b>Description</b>
<b>Federal</b>	
Occupational Safety & Health Act (OSHA); 29 U.S.C. § 651 et seq.	Protects workers from the effects of occupational noise exposure
U.S. Environmental Protection Agency (USEPA)	Assists state and local government entities in development of state and local LORS for noise

<b>Applicable LORS</b>	<b>Description</b>
<b>State</b>	
California Occupational Safety & Health Act (Cal-OSHA): 29 U.S.C. § 651 et seq., Cal. Code Regs., tit. 8, §§ 5095-5099	Protects workers from the effects of occupational noise exposure
<b>Local</b>	
Riverside County General Plan, Noise Element	Establishes goals, objectives, and procedures to protect the public from noise intrusion.
Riverside County Noise Ordinance, Ordinance 847 (Regulating Noise)	Specifies sound level limits. Limits hours of construction

## PUBLIC HEALTH

<b>Applicable LORS</b>	<b>Description</b>
<b>Federal</b>	
Clean Air Act section 112 (Title 42, U.S. Code section 7412)	This act requires new sources that emit more than 10 tons per year of any specified Hazardous Air Pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology.
<b>State</b>	
California Health and Safety Code section 25249.5 et seq. (Proposition 65)	These sections establish thresholds of exposure to carcinogenic substances above which Proposition 65 exposure warnings are required.
California Health and Safety Code section 41700	This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”
California Health and Safety Code Sections 44300 et seq.	Air Toxics Hot Spots Program requires participation in the inventory and reporting program at the local air pollution control district level.
California Health and Safety Code Sections 44360 - 44366	Air Toxics Hot Spots Information and Assessment Act requires that based on results of an HRA conducted per ARB/OEHHA guidelines, toxic contaminants do not exceed acceptable levels.

Applicable LORS	Description
California Public Resource Code section 25523(a); California Code of Regulations, Title 20 , section 1752.5, 2300–2309 and Division 2 Chapter 5, Article 1, Appendix B, Part (1); California Clean Air Act, Health and Safety Code section 39650, et seq.	These regulations require a quantitative health risk assessment for new or modified sources, including power plants that emit one or more toxic air contaminants (TACs).
<b>Local</b>	
South Coast Air Quality Management District (SCAQMD) Rule 402	Prohibits the discharge of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to the public; endanger the comfort, repose, health or safety of the public; or cause injury or damage to business or property.
SCAQMD Rule 1401	Discusses new source review for air toxics; specifies limits for maximum individual cancer risk, cancer burden, and noncancer acute and chronic hazard index from new permit units, relocations, or modifications to existing permit units which emit toxic air contaminants listed in Table I of the rule.
SCAQMD Rule 1470	Establishes fuel requirements, operating requirements and emission standards for stationary diesel-fueled internal combustion engines greater than 50 brake-horsepower.

## POWER PLANT RELIABILITY

No federal, state, local, or county laws, ordinances, regulations and standards (LORS) pertain to the reliability of this project.

## SOCIOECONOMICS

Applicable LORS	Description
<b>State</b>	
California Education Code, section 17620	The governing board of any school district is authorized to levy a fee, charge, dedication, or other requirement for the purpose of funding the construction or reconstruction of school facilities.
California Government Code, sections 65996-65997	Except for a fee, charge, dedication, or other requirement authorized under section 17620 of the Education Code, state and local public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.
California Revenue and Taxation Code, section 73	Allows property tax exclusion for certain types of solar energy systems. Assembly Bill 1451 extended the current property tax exclusion for new construction of solar energy systems to expire on January 1, 2017. If a project has started construction prior to the expiration date it would be eligible for the exclusion. After the exclusion sunsets, any solar energy system constructed remains exempt from property tax for so long as the property does not change ownership.

## SOIL & WATER

Applicable LORS	Description
<b>Federal</b>	
Clean Water Act of 1977 (Including 1987 Amendments) Sections 401, 402 and 404	<p>The primary objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's surface waters.</p> <p>Section 401: Requires certification that the proposed project is in compliance with established water quality standards.</p> <p>Section 402: Direct and indirect discharges and storm water discharges into waters of the United States must be made pursuant to a National Pollutant Discharge Elimination System (NPDES) permit.</p> <p>Section 404: Activities resulting in the dredging or filling of jurisdictional waters of the U.S. require authorization under a Section 404 permit issued by the U.S. Army Corp of Engineers (USACE).</p>
<b>State</b>	
State of California Constitution Article X, Section 2	Prohibits the waste or unreasonable use of water, regulates the method of use and method of diversion of water and requires all water users to conserve and reuse available water supplies to the maximum extent possible.
SWRCB Order 2009-0009-DWQ	The State Water Resources Control Board (SWRCB) regulates storm water discharges associated with construction affecting areas greater than or equal to 1 acre to protect state waters. Under Order 2009-0009-DWQ, the SWRCB has issued a NPDES General Permit for storm water discharges associated with construction activity.
SWRCB Order 97-03-DWQ	The SWRCB regulates storm water discharges associated with several types of facilities, including steam electric generating facilities. Under Order 97-03-DWQ, the SWRCB has issued a NPDES General Permit for storm water discharges associated with industrial activity.
California Water Code Section 461	Stipulates that the primary interest of the people of the State of California is the conservation of all available water resources and requires the maximum reuse of reclaimed water as an offset to using potable resources.
California Water Code Section 1200 "Water Rights"	California's water rights law is a hybrid system in that the use of certain types of water requires a permit from the SWRCB, while other types of uses are governed by common law.
The Porter-Cologne Water Quality Control Act of 1967, California Water Code Section 13000 et seq.	Requires the SWRCB and the nine Regional Water Quality Control Boards (RWQCBs) to adopt water quality standards to protect State waters. Those standards include the identification of beneficial uses, narrative and numerical water quality criteria, and implementation procedures.
California Code of Regulations Title 22, Article 3, Sections 64400.80 through 64445	This section requires monitoring for potable water wells, defined as non-transient, non-community water systems (serving 25 people or more for more than six months). Regulated wells must be sampled for bacteriological quality once a month and the results submitted to the California Department of Public Health (CDPH).

Applicable LORS	Description
California Code of Regulations Title 23, Division 3, Chapter 9	This chapter requires the Colorado River Basin RWQCB (CRBRWQCB) to issue a report of waste discharge for discharges of waste to land pursuant to the Water Code.
California Code of Regulations Title 23, Division 3, Chapter 15	Regulates all discharges of hazardous waste to land that may affect water quality.
<b>State Policies and Guidance</b>	
SWRCB Res. 68-16	Anti-Degradation Policy: This policy restricts degradation of surface and ground waters. In particular, this policy protects water bodies where existing quality is higher than necessary for the protection of beneficial uses.
SWRCB Res. 75-58	Power Plant Cooling Water Policy: The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for power plants that depend on inland waters for cooling.
SWRCB Res. 77-01	Water Reclamation Policy: Under this policy, the SWRCB and CRBRWQCBs shall encourage reclamation and reuse of water in water-short areas.
SWRCB Res. 92-49	Policies and Procedures for Investigations and Clean-up and Abatement of Discharges Under CWC Section 13304: Under this policy, clean-up and abatement actions are to implement applicable provisions of California Code of Regulations, Title 23, Chapter 15, to the extent feasible.
SWRCB Res. 2009-0011	Water Quality Control Policy for Recycled Water: The purpose of this Policy is to increase the use of recycled water from municipal wastewater sources that meets the definition in California Water Code Section 13050(n), in a manner that implements state and Federal water quality laws.
Public Resources Code Section 25300 et. seq.	The Energy Commission adopted a policy stating they would approve the use of "fresh inland" water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound."
State Water Policy	The Energy Commission has five authoritative sources for statements of policy relating to water use in California applicable to power plants. They are the California Constitution, the Warren-Alquist Act, the Commission's restatement of the state's water policy in the 2003 Integrated Energy Policy Report ("IEPR"), the State Water Resources Control Board resolutions (in particular Resolutions 75-58 and 88-63), and a letter from the Board to the Energy Commission interpreting Resolutions 75-58 and 88-63 [collectively referred to as the state's water policies - see Genesis Solar Project (09-AFC-08)].

<b>Local</b>	
Riverside County Ordinance Code, Title 13, Chapter 13.20	Establishes requirements to construct and operate groundwater wells.
Riverside County Ordinance Code, Title 8, Chapter 8.124	Establishes requirements to construct and operate sanitary wastewater disposal systems.
Riverside County Title 15 Chapter 15.24 Uniform Plumbing Code	Adopts by reference the California Plumbing Code, including the appendix and standards, for the installation and inspection of plumbing systems as a means of promoting the public's health, safety and welfare.
Riverside County Title 15 Chapter 15.80 Regulating Flood Hazard Areas and Implementing the National Flood Insurance Program	This ordinance was developed to comply with Title 44 CFR Part 65 regarding requirements for the identification and mapping of areas identified as Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas.

## TRAFFIC AND TRANSPORTATION

<b>Applicable LORS</b>	<b>Description</b>
<b>Federal</b>	
Title 14, Code of Federal Regulations, Aeronautics and Space, part 77 - Objects Affecting Navigable Airspace (14 C.F.R. part 77)	These regulations establish standards for determining physical obstructions to navigable airspace; set noticing and hearing requirements; provide for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace; and oversee the development of antenna farm areas.
Title 49, Code of Federal Regulations Subtitle B, parts 171-173, 177-178, 350-359, 397.9 and Appendices A-G	Addresses safety considerations for the transport of goods, materials, and substances. Governs the transportation of hazardous materials including types of materials and marking of the transportation vehicles.
<b>State</b>	
California Vehicle Code, sections 353; 2500-2505; 31303-31309; 32000-32053; 32100-32109; 31600-31620; California Health and Safety Code, sections 25160 et seq.	Regulates the highway transport of hazardous materials.
California Vehicle Code, sections 13369; 15275 and 15278	Addresses the licensing of drivers and the classification of licenses required for the operation of particular types of vehicles; also requires certificates permitting operation of vehicles transporting hazardous materials.
California Vehicle Code, sections 35100 et seq.; 35250 et seq.; 35400 et seq.	Specifies limits for vehicle width, height, and length.
California Vehicle Code, section 35780	Requires permits for any load exceeding Caltrans weight, length, or width standards on public roadways.

<b>Applicable LORS</b>	<b>Description</b>
California Streets and Highways Code, sections 117, 660-672	Requires permits for any load exceeding Caltrans weight, length, or width standards on County roads.
California Streets and Highways Code, sections 117, 660-670, 1450, 1460 et seq., and 1480 et seq.	Regulates permits from Caltrans for any roadway encroachment from facilities that require construction, maintenance, or repairs on or across State highways and County roads.
<b>Local</b>	
Riverside County General Plan Circulation Element	Specifies long-term planning goals and procedures for transportation infrastructure system quality.
Riverside County General Plan Circulation Element	Specifies LOS standards used to assess the performance of a street or highway system and the capacity of a roadway.
Riverside County Municipal Code Title 10, Chapter 10.08, Sections 10.08.010-10.08.180	Specifies limits and permit requirements for oversize loads.
Riverside County Municipal Code Title 12, Chapter 12.08, Sections 12.08.010-12.08.100	Specifies requirements for encroachment permits.

## TRANSMISSION LINE SAFETY AND NUISANCE

<b>Applicable LORS</b>	<b>Description</b>
<b>Aviation Safety</b>	
<b>Federal</b>	
Title 14, Part 77 of the Code of Federal Regulations (CFR), "Objects Affecting the Navigable Air Space"	Describes the criteria used to determine the need for a Federal Aviation Administration (FAA) "Notice of Proposed Construction or Alteration" in cases of potential obstruction hazards.
FAA Advisory Circular No. 70/7460-1G, "Proposed Construction and/or Alteration of Objects that May Affect the Navigation Space"	Addresses the need to file the "Notice of Proposed Construction or Alteration" form (Form 7640) with the FAA in cases of potential for an obstruction hazard.
FAA Advisory Circular 70/460-1G, "Obstruction Marking and Lighting"	Describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.
<b>Interference with Radio Frequency Communication</b>	
<b>Federal</b>	
Title 47, CFR, section 15.2524, Federal Communications Commission (FCC)	Prohibits operation of devices that can interfere with radio-frequency communication.
<b>State</b>	
California Public Utilities Commission (CPUC) General Order 52 (GO-52 )	Governs the construction and operation of power and communications lines to prevent or mitigate interference.
<b>Audible Noise</b>	

Applicable LORS	Description
<b>Local</b>	
Riverside County General Plan, Noise Element	Establishes policies and programs to ensure that noise levels are appropriate to land uses.
Riverside County Noise Ordinance	Establishes performance standards for planned residential or other noise-sensitive land uses.
<b>Hazardous and Nuisance Shocks</b>	
<b>State</b>	
CPUC GO-95, "Rules for Overhead Electric Line Construction." CPUC GO-128. Rules for Construction of Underground Electric Supply and Communication Systems.	Governs clearance requirements to prevent hazardous shocks, grounding techniques to minimize nuisance shocks, and maintenance and inspection requirements. Establishes requirements and minimum standards for installing underground lines and communication circuits.
California Code of Regulations, Title 8, section 2700 et seq. "High Voltage Safety Orders"	Specifies requirements and minimum standards for safely installing, operating, working around, and maintaining electrical installations and equipment.
National Electrical Safety Code	Specifies grounding procedures to limit nuisance shocks. Also specifies minimum conductor ground clearances.
<b>Industry Standards</b>	
Institute of Electrical and Electronics Engineers (IEEE) 1119, "IEEE Guide for Fence Safety Clearances in Electric-Supply Stations"	Specifies the guidelines for grounding-related practices within the right-of-way and substations.
<b>Electric and Magnetic Fields</b>	
<b>State</b>	
GO-131-D, CPUC "Rules for Planning and Construction of Electric Generation Line and Substation Facilities in California"	Specifies application and noticing requirements for new line construction including EMF reduction.
CPUC Decision 93-11-013	Specifies CPUC requirements for reducing power frequency electric and magnetic fields.
<b>Industry Standards</b>	
American National Standards Institute (ANSI/IEEE) 644-1944 Standard Procedures for Measurement of Power Frequency Electric and Magnetic Fields from AC Power Lines	Specifies standard procedures for measuring electric and magnetic fields from an operating electric line.
<b>Fire Hazards</b>	
<b>State</b>	
California Code of Regulations, Title 14, sections 1250-1258, "Fire Prevention Standards for Electric Utilities"	Provides specific exemptions from electric pole and tower firebreak and conductor clearance standards and specifies when and where standards apply.

Applicable LORS	Description
<b>TRANSMISSION SYSTEM ENGINEERING</b>	
California Public Utilities Commission (CPUC) General Order 95 (GO-95)	“Rules for Overhead Electric Line Construction”, formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general
California Public Utilities Commission (CPUC) General Order 128 (GO-128)	“Rules for Construction of Underground Electric Supply and Communications Systems”, formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.

Applicable LORS	Description
The National Electric Safety Code, 2012	<p>The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on NERC Standards TPL-001 through TPL-004 of the standards and “Table I. Transmission System Standards _ Normal and Emergency Conditions” and WECC Disturbance-Performance Table” and on Section I.D, “NERC and WECC Standards for Voltage Support and Reactive Power”. These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC Ongoing).</p>
NERC/WECC Planning Standards	<p>Provides national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC Ongoing).</p>

Applicable LORS	Description
<p>North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America</p>	<p>Provides national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC Ongoing).</p>
<p>California ISO Planning Standards</p>	<p>Also provides standards and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow, stability simulations, Special Protection Systems and Load Interruption Standards, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not address in the NERC / WECC standards, provide interpretations of the NERC/WECC criteria specific to the ISO grid, and identify whether specific criteria should be adopted. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO. The California ISO standards will be revised from time to time to ensure they are consistent with the current state of the electrical industry and in conformance with NERC Reliability Standards and WECC Regional Criteria (California ISO June, 23 2011).</p>
<p>California ISO/FERC Electric Tariff</p>	<p>Provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the "Need" for the proposed modified project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed modified project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).</p>

## VISUAL RESOURCES

Applicable LORS	Description
<b>Federal</b>	
California Desert Conservation Area (CDCA) Plan	<p>PSEGS is located within the California Desert Conservation Area Plan, which is the BLM Resource Management Plan applicable to the project site (USDOI, 1980, as amended). The CDCA Plan did not include Visual Resource Management (VRM) inventory or management classes. However, a BLM-approved Visual Resource Inventory (VRI) was conducted in 2005 for the Devers-Palo Verde 2 Transmission Line Project EIS/EIR, which covers the project site.</p> <p>The PSEGS site is classified in the CDCA Plan as Multiple-Use Class (MUC) M (Moderate Use). Management of MUC M lands is based upon a controlled balance between higher intensity use and protection of public lands. This class provides for a wide variety of present and future uses such as mining, live- stock grazing, recreation, energy, and utility development. Class M management is also designed to conserve desert resources and to mitigate damage to those resources, which permitted uses may cause.</p> <p>The CDCA Plan includes a table (Table 1), which illustrates the types of allowable land uses by MUC Class. The table specifically includes Electrical Power Generation Facilities including Wind/Solar facilities. Guidance provided under this section allows for the authorization of such facilities within MUC M lands in compliance with National Environmental Policy Act (NEPA) requirements.</p> <p>New major electric transmission facilities may be allowed only within designated utility corridors. Existing facilities within designated utility corridors may be maintained and upgraded or improved in accordance with existing rights-of-way or amendments to right-of- way grants.</p>
<b>State</b>	
California Streets and Highways Code, sections 260 through 263, State Scenic Highway Program	The California State Department of Transportation (Caltrans) identifies a state system of eligible and designated scenic highways, which, if designated, are subject to various controls intended to preserve their scenic quality (
<b>Local</b>	
Riverside County Integrated Plan LU-4 Relating to Project Design	<p>LU 4.1 Requires that new developments be located and designed to visually enhance, not degrade the character of the surrounding area through consideration of the following concepts:</p> <p>c. Require that an appropriate landscape plan be submitted and implemented for development projects subject to discretionary review.</p>

Applicable LORS	Description
	d. Require that new development utilize drought- tolerant landscaping and incorporate adequate drought-conscious irrigation systems.
	l. Mitigate noise, odor, lighting, and other impacts on surrounding properties.
	m. Provide and maintain landscaping in open spaces and parking lots.
	n. Include extensive landscaping.
	o. Preserve natural features, such as unique natural terrain, drainage ways, and native vegetation, wherever possible, particularly where they provide continuity with more extensive regional systems.
	p. Require that new development be designed to provide adequate space for pedestrian connectivity and access, recreational trails, vehicular access and parking, supporting functions, open space, and other pertinent elements.
	<p>LU 4.2 Require property owners to maintain structures and landscaping to a high standard of design, health, and safety through the following:</p> <p>c. Promote and support community and neighborhood based efforts for the maintenance, upkeep, and renovation of structures and sites.</p>
County Scenic Corridors	LU 13.1 Preserve and protect outstanding scenic vistas and visual features for the enjoyment of the traveling public.

Applicable LORS	Description
	<p>LU 13.3 Ensure that the design and appearance of new landscaping, structures, equipment, signs, or grading within Designated and Eligible State and County scenic highway corridors are compatible with the surrounding scenic setting or environment.</p>
	<p>LU 13.7 Require that the size, height, and type of on-premise signs visible from Designated and Eligible State and County Scenic Highways be the minimum necessary for identification. The design, materials, color, and location of the signs shall blend with the environment, utilizing natural materials where possible.</p>
	<p>LU 13.8 Avoid the blocking of public views by solid walls.</p>
<p>The following policies apply to properties designated as Open Space-Rural on the area plan land use maps.</p>	<p>LU 20.1 Require that structures be designed to maintain the environmental character in which they are located.</p>
	<p>LU 20.2 Require that development be designed to blend with undeveloped natural contours of the site and avoid an unvaried, unnatural, or manufactured appearance.</p>
	<p>LU 20.4 Ensure that development does not adversely impact the open space and rural character of the surrounding area.</p>

## WASTE MANAGEMENT

Applicable LORS	Description
<b>Federal</b>	
<p>Title 42, United States Code (U.S.C.), §6901, et seq.</p> <p>Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.)</p>	<p>The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions.</p> <p>RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing:</p> <ul style="list-style-type: none"> <li>• Generator record keeping practices that identify quantities of hazardous wastes generated and their disposition;</li> <li>• Waste labeling practices and use of appropriate containers;</li> <li>• Use of a manifest when transporting wastes;</li> <li>• Submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and</li> <li>• Corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities.</li> </ul> <p>RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills.</p> <p>RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9) implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii.</p>
<p>Title 42, U.S.C., §9601, et seq.</p> <p>Comprehensive Environmental Response, Compensation and Liability Act</p>	<p>The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses:</p> <ul style="list-style-type: none"> <li>• Reporting requirements for releases of hazardous substances;</li> <li>• Requirements for remedial action at closed or abandoned hazardous waste sites, and brownfields;</li> <li>• Liability of persons responsible for releases of hazardous substances or waste; and</li> <li>• Requirements for property owners/potential buyers to conduct “all appropriate inquiries” into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site, and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA “all appropriate inquiries” requirements.</li> </ul>
<p>Title 40, Code of Federal Regulations</p>	<p>These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal</p>

Applicable LORS	Description
(C.F.R.), Subchapter I – Solid Wastes	<p>facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes.</p> <ul style="list-style-type: none"> <li>• Part 257 addresses the criteria for classification of solid waste disposal facilities and practices.</li> <li>• Part 258 addresses the criteria for municipal solid waste landfills.</li> <li>• Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps).</li> </ul> <p>U.S. EPA implements the regulations at the federal level. However, California is a RCRA-authorized state, so most of the solid and hazardous waste regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA.</p>
<p>Title 49, C.F.R., Parts 172 and 173. Hazardous Materials Regulations</p>	<p>These regulations address the United States Department of Transportation (DOT) established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste manifests in accordance with Title 40, CFR, section 262.20.</p>
<p>Federal Clean Water Act, 33 U.S.C. §1251 et seq.</p>	<p>The Clean Water Act controls discharge of wastewater to the surface waters of the U.S.</p>
<b>State</b>	
<p>California Health and Safety Code (Health and Safety Code), Chapter 6.5, §25100, et seq.  Hazardous Waste Control Act of 1972, as amended</p>	<p>This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements.</p> <p>The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.</p>
<p>Title 22, California Code of Regulations (Cal. Code Regs.), Division 4.5.  Environmental Health Standards for the Management of Hazardous Waste</p>	<p>These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers; prepare manifests before transporting the waste off site; and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters.</p> <p>The standards addressed by Title 22, CAL. CODE REGS. include:</p>

Applicable LORS	Description
	<ul style="list-style-type: none"> <li>• Identification and Listing of Hazardous Waste (Chapter 11, §66261.1, et seq.).</li> <li>• Standards Applicable to Generator of Hazardous Waste (Chapter 12, §66262.10, et seq.).</li> <li>• Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §66263.10, et seq.).</li> <li>• Standards for Universal Waste Management (Chapter 23, §66273.1, et seq.).</li> <li>• Standards for the Management of Used Oil (Chapter 29, §66279.1, et seq.).</li> <li>• Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §67450.1, et seq.).</li> </ul> <p>The Title 22 regulations are established and enforced at the state level by DTSC. Some generator and waste treatment standards are also enforced at the local level by CUPAs.</p>
<p>Health and Safety Code, Chapter 6.11 §§25404 – 25404.9</p> <p>Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)</p>	<p>The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below.</p> <ul style="list-style-type: none"> <li>• Aboveground Petroleum Storage Act requirements for Spill Prevention, Control, and Countermeasure (SPCC) Plans.</li> <li>• Hazardous Materials Release and Response Plans and Inventories (Business Plans).</li> <li>• California Accidental Release Prevention (CalARP) Program.</li> <li>• Hazardous Materials Management Plan / Hazardous Materials Inventory Statements.</li> <li>• Hazardous Waste Generator / Tiered Permitting Program.</li> <li>• Underground Storage Tank Program.</li> </ul> <p>The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as CUPAs. The DTSC’s Calexico Field Office is the CUPA for the SES Solar Two project.</p> <p>Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program.</p>
<p>California Code of Regulations, Title 27, Division 1, Subdivision 4, Chapter 1, §15100, et seq.</p> <p>Unified Hazardous Waste and Hazardous Materials Management Regulatory Program</p>	<p>While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses.</p> <ul style="list-style-type: none"> <li>• Article 9 – Unified Program Standardized Forms and Formats (§§ 15400–15410).</li> <li>• Article 10 – Business Reporting to CUPAs (§§15600–15620).</li> </ul>

Applicable LORS	Description
<p>Public Resources Code, Division 30, §40000, et seq.</p> <p>California Integrated Waste Management Act of 1989 (AB 939)</p>	<p>The California Integrated Waste Management Act (CIWMA) (AB 939) sets mandates and standards for management of solid waste in California for local jurisdictions (cities and counties) and the state. AB 939 sets landfill diversion requirements; a preferred waste management hierarchy (source reduction first, then recycling and reuse, and treatment and disposal last); standards for design and construction of municipal landfills; and programs for county waste management plans and local implementation of solid waste requirements. AB 939 is designed to reduce the volume and toxicity of solid waste landfilled and incinerated by requiring local governments to prepare and implement plans to improve the management of waste resources. AB 939 set out the requirement to reduce the amount of solid waste disposed in landfills and transformed by 50 percent by the year 2000 and every year thereafter, through source reduction, recycling, and composting.</p>
<p>California Code of Regulations, Title 14, Division 7, §17200, et seq.</p> <p>California Integrated Waste Management Board</p>	<p>These regulations implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions.</p> <ul style="list-style-type: none"> <li>• Chapter 3 – Minimum Standards for Solid Waste Handling and Disposal.</li> <li>• Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste.</li> <li>• Chapter 7 – Special Waste Standards.</li> <li>• Chapter 8 – Used Oil Recycling Program.</li> <li>• Chapter 8.2 – Electronic Waste Recovery and Recycling.</li> </ul>
<p>Health and Safety Code, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq.</p> <p>Hazardous Waste Source Reduction and Management Review Act of 1989</p>	<p>This law was enacted to expand the state’s hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (approximately 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a four-year cycle, with a summary progress report due to DTSC every fourth year.</p>
<p>California Code of Regulations, Title 22, §67100.1 et seq.</p> <p>Hazardous Waste Source Reduction and Management Review</p>	<p>These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review elements and reporting requirements to be completed by generators subject to the act.</p>
<p>California Code of Regulations, Title 23, Division 3, Chapters 16 and 18</p>	<p>These regulations relate to hazardous material storage and petroleum UST cleanup, as well as hazardous waste generator permitting, handling, and storage. The DTSC Imperial County CUPA is responsible for local enforcement.</p>

Applicable LORS	Description
<b>Local</b>	
County of Riverside General Plan, Safety Element: Policy S 6.1	Describes the County's policies and siting criteria identified in the County of Riverside Hazardous Waste Management Plan including coordination of hazardous waste facility responsibilities on a regional basis through the Southern California Hazardous Waste Management Authority
Riverside County Integrated Waste Management Program	The Countywide Integrated Waste Management Plan (CIWMP) was prepared in accordance with the California Integrated Waste Management Act of 1989, Chapter 1095 (AB 939) to ensure the County's compliance with the requirements of AB 939.
Riverside County Code Title 8 Chapters 8.60, 8.84, and 8.132, Health and Safety	Establishes requirements for the use, generation, storage, and disposal of hazardous and non-hazardous materials and wastes within the County.

### WORKER SAFETY/FIRE PROTECTION

Applicable LORS	Description
<b>Federal</b>	
Title 29 U.S. Code (USC) section 651 et seq (Occupational Safety and Health Act of 1970)	This act mandates safety requirements in the workplace with the purpose of "[assuring] so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources" (29 USC §651).
Title 29 Code of Federal Regulation (CFR) sections 1910.1 to 1910.1500 (Occupational Safety and Health Administration Safety and Health Regulations)	These sections define the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.
29 CFR sections 1952.170 to 1952.175	These sections provide federal approval of California's plan for enforcement of its own Safety and Health requirements, in lieu of most of the federal requirements found in 29 CFR sections 1910.1 to 1910.1500.
<b>State</b>	
California Code of Regulations Title 8 all applicable sections (Cal/OSHA regulations)	These sections require that all employers follow these regulations as they pertain to the work involved. This includes regulations pertaining to safety matters during construction, commissioning, and operations of power plants, as well as safety around electrical components, fire safety, and hazardous materials use, storage, and handling.
24 Cal Code Regs. section 3, et seq.	This section incorporates the current addition of the Uniform Building Code.
Health and Safety Code section 25500, et seq.	This section presents Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at a facility.

Applicable LORS	Description
Health and Safety Code sections 25500 to 25541	These sections require a Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at a facility.
<b>Local (or locally enforced)</b>	
Riverside County Ordinance 457	Adopts specific building, mechanical, plumbing, and electrical codes from sources such as the California Building Standards Commission with county-specific modifications.
Riverside County Ordinance 787.6	Adopts the 2010 edition of the California Fire Code and portions of the 2010 edition of the California Building Code with county-specific modifications.
Riverside County Ordinance 615	Establishes requirements for the use, generation, storage and disposal of hazardous materials within the County.
Riverside County Department of Environmental Health, Hazardous Materials Releases	Adopts State requirements and guidelines to govern hazardous materials release response plans and inventories.
NFPA 850	This industry standard of the National Fire Protection Association (NFPA) address fire protection at electrical generating stations.
Chapter 22 of the 2010 California Fire Code	This section of the CFC addresses requirement for Motor Fuel-Dispensing Facilities and Repair Garages. It has been adopted by Riverside County and will apply to the fuel depot at the site.
NFPA 30a	This is the NFPA code for Motor Fuel Dispensing Facilities and Repair Garages (2008Edition) and is the industry standard for fuel depots.

**APPENDIX B****CALIFORNIA  
ENERGY COMMISSION**

## Exhibit List

Docket: 09-AFC-07C

Project Title: Palen Solar Power Project - Compliance

Generated On: 9/4/2014 9:10:57 AM

Exhibit Number	Document Title and Description	Disposition
1001	TN # 65936 Petition for Ownership from Palen Solar I to NALEP Solar Project I LLC Petition for Ownership from Palen Solar I to NALEP Solar Project I LLC	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1002	TN # 66018 Revision to June 25, 2012 Petition for Ownership Transfer Revision to June 25, 2012 Petition for Ownership Transfer	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1003	TN # 68910 Palen Solar Holdings LLC's Petition for Amendment Palen Solar Holdings LLC's Petition for Amendment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1004	TN # 69471 Palen Solar Holding's Supplement Number One to Support Petition to Amendment (the files can be obtained from Dockets on request)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1005	TN # 69601 Palen Solar's Response to Staff's Issue Identification	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Report Palen Solar's Response to Staff's Issue Identification Report	10/28/2013.
1006	TN # 69693 GIS Data Request - Biological Resources GIS Data Request - Biological Resources	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1007	TN # 69909 Palen Solar Holdings, LLC's Supplement Number Two - Complete Air Quality and Public Health Sections Palen Solar Holdings, LLC's Supplement Number Two - Complete Air Quality and Public Health Sections	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1008	TN # 69931 Palen Solar's Relocated Natural Gas Pipeline Drawing Palen Solar's Relocated Natural Gas Pipeline Drawing	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1009	TN # 70015 Preliminary Draft Construction Drainage, Erosion and Sedimentation Control Plan - Stormwater Pollution Prevention Plan (the files can be obtained from Dockets on request)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1010	TN # 70096 Palen Solar Holdings, LLC's Response to CEC Data Request Set 1 (1-18) Palen Solar Holdings, LLC's Response to CEC Data Request Set 1 (1-18)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1011	TN # 70152 Palen Solar's Preliminary Draft Drainage Erosion and Sedimentation Control Plan/ Stormwater Pollution Prevention Plan Supplement - Appendix A Palen Solar's Preliminary Draft Drainage Erosion and Sedimentation Control Plan/ Stormwater Pollution	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.

Exhibit Number	Document Title and Description	Disposition
	Prevention Plan Supplement - Appendix A	
1012	TN # 70179 Palen Solar Holdings, LLC's Status Report One Palen Solar Holdings, LLC's Status Report One	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1013	TN # 70200 Palen Solar Holdings LLC's Supplemental Response to CEC Staff Data Request Five Palen Solar Holdings LLC's Supplemental Response to CEC Staff Data Request Five	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1014	TN # 70242 Palen Solar Electric Generating System Winter 2013 Golden Eagle Survey Results Palen Solar Electric Generating System Winter 2013 Golden Eagle Survey Results	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1015	TN # 70251 Palen Solar Generating Station's Tower Viewshed Delineation - Potential Sensitive Receptors Palen Solar Generating Station's Tower Viewshed Delineation - Potential Sensitive Receptors	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1016	TN # 70343 Palen Solar's Revised Tower Delineation - Potential Sensitive Receptors Palen Solar's Revised Tower Delineation - Potential Sensitive Receptors	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1017	TN # 70448 Palen Solar Holdings, LLC's Supplement No.Three Palen Solar Holdings, LLC's Supplement No.Three	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1018	TN # 70786 Palen Solar Electric Air Quality Modeling Files	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Palen Solar Electric Air Quality Modeling Files	10/28/2013.
1019	TN # 70670 Palen Solar Holdings' Status Report Two Palen Solar Holdings' Status Report Two	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1020	TN # 70763 Palen Solar Holdings, LLC's Oblique View of Palen Solar Electric Generating System Palen Solar Holdings, LLC's Oblique View of Palen Solar Electric Generating System	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1021	TN # 70785 Palen Solar Holdings LLC's Response to Workshop Queries Palen Solar Holdings LLC's Response to Workshop Queries	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1022	TN # 70813 E-mail Correspondence Regarding Waters Guidance E-mail Correspondence Regarding Waters Guidance	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1023	TN # 70799 Andrea Grenier Email to C. Stora Andrea Grenier Email to C. Stora	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1024	TN # 70819 Palen Solar Holdings, LLC's Request for Status Conference Palen Solar Holdings, LLC's Request for Status Conference	Offered by Applicant (Palen Solar Holdings, LLC); OFFERED.
1025	TN # 70861 Palen Solar LLC's Tower Viewshed Delineation—Minus Condensers Palen Solar LLC's Tower Viewshed Delineation—Minus	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.

Exhibit Number	Document Title and Description	Disposition
	Condensers	
1026	TN # 70896 Palen Solar Holdings, LLC's Response to CEC Staff Data Request Set Two 19-39 Palen Solar Holdings, LLC's Response to CEC Staff Data Request Set Two 19-39	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1027	TN # 70897 Palen Solar Holdings, LLC's Summary of Spring Wildlife & Plant Surveys Palen Solar Holdings, LLC's Summary of Spring Wildlife & Plant Surveys	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1028	TN # 70912 Andrea Grenier's Email to CEC's Christine Stora re Project Description Questions Andrea Grenier's Email to CEC's Christine Stora re Project Description Questions	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1029	TN # 70970 Andrea Grenier Email to Christine Stora regarding Section 4.3 Hazardous Material Andrea Grenier Email to Christine Stora regarding Section 4.3 Hazardous Material	Offered by Applicant Representative (Scott Galati); Admitted on 10/28/2013.
1030	TN # 70976 Applicant's Submittal Wesley A. Alston's Resume Applicant's Submittal Wesley A. Alston's Resume	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1031	TN # 70980 Applicant's Additional Transmission System Engineering Information Related to SCE's Red Bluff Substation Applicant's Additional Transmission System Engineering Information Related to SCE's Red Bluff Substation	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
1032	TN # 70991 Applicant's Draft Weed Management Plan Applicant's Draft Weed Management Plan	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1033	TN # 71087 Palen Solar Generating Station's Submittal of the Joshua Tree National Park Visual Resources Analysis Report Palen Solar Generating Station's Submittal of the Joshua Tree National Park Visual Resources Analysis Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1034	TN # 71098 Palen Solar's Visual Resources Analysis Report Palen Solar's Visual Resources Analysis Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1035	TN # 71123 Palen Solar's Spring 2013 Golden Eagle Nest Survey Results Interim Report Palen Solar's Spring 2013 Golden Eagle Nest Survey Results Interim Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1036	TN # 71131 Palen Solar's Summary of Survey for Jurisdictional State Waters Palen Solar's Summary of Survey for Jurisdictional State Waters	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1037	TN # 71153 Palen Solar's Preliminary Spring 2013 Pre-Construction & Avian Field Survey Results Palen Solar's Preliminary Spring 2013 Pre-Construction & Avian Field Survey Results	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1038	TN # 71154 Palen Solar's Scope of Work for PSEGS Summer 2013 Pre-Construction & Avian Field Surveys Palen Solar's Scope of Work for PSEGS Summer 2013	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
	Pre-Construction & Avian Field Surveys	
	TN # 71244 Revised Table 2.4-1 Average Daily Water Requirements (Both Solar Plants) for Palen Solar Holdings LLC's Petition to Amend	
1039	Revised Table 2.4-1 Average Daily Water Requirements (Both Solar Plants) for Palen Solar Holdings LLC's Petition to Amend	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
	TN # 71280 Palen Solar Holdings, LLC's Response to CEC Staff Data Request Set Three, Numbers 40-72	
1040	Palen Solar Holdings, LLC's Response to CEC Staff Data Request Set Three, Numbers 40-72	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
	TN # 71551 Palen Solar Holdings, LLC's Initial Comments on the Preliminary Staff Assessment	
1041	Palen Solar Holdings, LLC's Initial Comments on the Preliminary Staff Assessment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
	TN # 71554 Emails between CEC's Christine Stora and Andrea Grenier re CEC's Andrea Koch's Traffic Question	
1042	Emails between CEC's Christine Stora and Andrea Grenier re CEC's Andrea Koch's Traffic Question	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
	TN # 71692 Air Quality Health Risk Assessment Modeling Files (the files can be obtained from Dockets on request)	
1043	Air Quality Health Risk Assessment Modeling Files	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
	TN # 71688 Palen Solar Holding LLC's Supplemental Response to Data Request 14 - Traffic Study Update	
1044	Palen Solar Holding LLC's Supplemental Response to	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
	Data Request 14 - Traffic Study Update	
1045	TN # 71690 Revised Supplement Number Two - Complete Air Quality and Public Health Sections Revised Supplement Number Two - Complete Air Quality and Public Health Sections	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1046	TN # 71695 Supplemental Socioeconomic Information Requested By Staff in PSA Supplemental Socioeconomic Information Requested By Staff in PSA	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1047	TN # 200009 Palen Solar Holding's Bat Habitat Assessment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1048	TN # 200010 PSH LLC's Spring 2013 Avian Survey Results	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1049	TN # 200011 PSH LLC's Supplemental Spring 2013 Biological Surveys	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1050	TN # 200012 PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1051	TN # 200031 PSH LLC's Fire & Emergency Services Risk Assessment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1052	TN # 200036 PSH LLC's Advance Response to Data Request 82	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/29/2013.
1053	TN # 200040 PSH LLC's Wastewater Discharge Requirements	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1054	TN # 200043 SCAQMD letter deeming application package complete	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 11/22/2013.
1055	TN # 200046 Palen Solar Holdings, LLC's Response to Data Requests 78-81	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1056	TN # 200048 Record of Conversation between G. Darvin & A. Chu Regarding Palen HRA with Mirror Washing - Reduced Risk Values in Table	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1057	TN # 200077 Palen Solar Holdings, LLC's Final Comments on the Preliminary Staff Assessment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1058	TN # 200085 PSH's Supplemental Comments on the 7/26/13 Version of Condition of Certification BIO-17	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1059	TN # 200090 Palen Solar Holdings, LLC's Status Report 3	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1060	TN # 200098 PSH's Response to Data Request Set 4 (73-89)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1061	TN # 200100	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	PSH's Supplemental Response to Data Request 40d & 44	10/29/2013.
1062	TN # 200115 Palen Solar Holding's Response to Center for Biological Diversity's Data Requests (1-2)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1063	TN # 200116 Supplemental Traffic Data Information Requested by Staff in 7/31/13 Email	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1064	TN # 200118 Palen Solar Holding's Supplemental Response to CEC Staff Data Requests 54 & 55	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1065	TN # 200148 Palen Solar Holding's Response to Data Request 56 Per Counsel cover letter should reflect 8/9/13, not 8/6/13.	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1066	TN # 200170 Applicant Response to CEC Data Request 57- Part 1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1067	TN # 200186 PSH's Revised Supplemental Response to DR 54 & 55	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1068	TN # 200188 PSH's RESPONSE TO STAFF'S 8/2/13 EMAIL REQUEST	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1069	TN # 200190 Applicant's Traffic Consultant's Response re Traffic Questions from CEC and CalTrans	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1070	TN # 200204 PSH's Lake or Streambed Alteration Agreement	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Amendment Notification	10/29/2013.
1071	TN # 200213 Palen Solar Holding's Final Sand Transport Study Supplement No.1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1072	TN # 200268 Email re CEC request for GIS data 08132013 CEC request for GIS data in re Mojave fringe toed lizard	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1073	TN # 200371 FAA Determinations of No Hazard to Air Navigation	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1074	TN # 200381 Correspondence between Rafael Cobian and Andrea Koch re regarding Palen operations traffic	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1075	TN # 200463 Revised - Table I. Estimated area of indirect impact resulting from construction of PSEGS facility	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1076	TN # 200667 PSH's Opening Testimony- Batch 1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1077	TN # 200806 Palen Solar Holding's Opening Testimony - Batch 2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1078	TN # 200848 PSEGS 1-10 Desert Tortoise Exclusion Fence Project Description	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1080	TN # 200968 PSH's Rebuttal Testimony to Intervenor CBD's Opening	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Testimony	10/29/2013.
1081	TN # 200969 PSH's Rebuttal Testimony to Intervenor CRIT's Opening Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1082	TN # 200013 Figure 1-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1083	TN # 200014 Figure 2-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1084	TN # 200015 Figure 3-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1085	TN # 200016 Figure 4-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1086	TN # 200017 Figure 5-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1087	TN # 200018 Figure 6-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1088	TN # 200019 Figure 7-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1089	TN # 200020 Figure 8-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/28/2013.
1090	TN # 200021 Figure 9-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1091	TN # 200022 Figure 10-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1093	TN # 200023 Figure 11-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1094	TN # 200024 Figure 12-PSH LLC's Final Sand Transport Study	Offered by Applicant Representative (Scott Galati); Admitted.
1095	TN # 200025 Figure 13-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1096	TN # 200026 Figure 14-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1097	TN # 200027 Figure 15-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1098	TN # 200028 Figure 16-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1099	TN # 200029 Figure 17-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/29/2013.
1100	TN # 200030 Figure 18-PSH LLC's Final Sand Transport Study	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1101	TN # 200037 PSH, LLC's Advance Response to Data Request 82_.xlsx spreadsheet	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1102	TN # 200171 Applicant Response to CEC Data Request 57- Part 2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1103	TN # 200172 Applicant Response to CEC Data Request 57- Part 3	Offered by Applicant Representative (Scott Galati); Admitted on 10/28/2013.
1104	TN # 200173 Applicant Response to CEC Data Request 57- Part 4.1	Offered by Applicant Representative (Scott Galati); Admitted on 10/28/2013.
1105	TN # 200174 Applicant Response to CEC Data Request 57- Part 4.2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1106	TN # 200175 Applicant Response to CEC Data Request 57- Part 5.1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1107	TN # 200176 Applicant Response to CEC Data Request 57- Part 5.2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1108	TN # 200177 Applicant Response to CEC Data Request 57- Part 5.3	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/28/2013.
1109	TN # 200178 Applicant Response to CEC Data Request 57- Part 5.4	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1110	TN # 200179 Applicant Response to CEC Data Request 57- Part 6	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1111	TN # 200180 Applicant Response to CEC Data Request 57- Part 7.1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1112	TN # 200181 Applicant Response to CEC Data Request 57- Part 7.2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1113	TN # 200182 Applicant Response to CEC Data Request 57- Part 7.3	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1114	TN # 200183 Applicant Response to CEC Data Request 57- Part 7.4	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1115	TN # 200184 Applicant Response to CEC Data Request 57- Proof of Service	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1116	TN # 200191 Email Responding to Traffic Questions-Attachment 1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1117	TN # 200192 Email Responding to Traffic Questions-Attachment 2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/28/2013.
1118	TN # 200193 Email Responding to Traffic Questions-Attachment 3	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1119	TN # 200194 Email Responding to Traffic Questions-Attachment 4	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1120	TN # 200195 Email Responding to Traffic Questions-Attachment 5	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1121	TN # 200196 Email Responding to Traffic Questions-Attachment 6	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/28/2013.
1122	TN # 201054 Palen Solar Holding's Proposed Modifications to BIO Conditions contained in Staff's Rebuttal Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 10/29/2013.
1123	TN # 201323 Exhibit 55 in the RSEP Proceeding	Offered by Applicant (Palen Solar Holdings, LLC); OFFERED on 11/25/2013.
1124	TN # 201713 Palen Solar Holdings, LLC's Alternatives Supplemental Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1125	TN # 201704 Palen Solar Holdings, LLC's Overriding Considerations Supplemental Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1126	TN # 201700 Palen Solar Holdings, LLC's Proposed Revisions of Staff's	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Condition of Certification CUL-1	7/29/2014.
1127	TN # 201735 Palen Solar Holdings, LLC's Response to Center for Biological Diversity's Data Request (2:7:14)	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1128	TN # 201809 Palen Solar Holdings, LLC's Proposed Revisions to Condition of Certification BIO-16b	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1129	TN # 201817 Palen Solar Holdings, LLC's Drawing Showing Potential Future Thermal Storage Equipment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1130	TN # 201838 Palen Solar Holdings, LLC's Review of Potential Bird Deterrent Strategies for Large Scale Solar Facilities	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1131	TN # 202002 Fall 2013 Avian Field Surveys for Palen Solar Electric Generating System	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
1132	TN # 202000 Fall 2013 Nocturnal Migration Surveys for Palen Solar Electric Generating System Final Report	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
1133	TN # 202751 Revised Ex.1133 - Updated Avian Comparison Table	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1134	TN # 202482 Ex.1134 - Biological Resources Supplemental Opening Testimony Wally P. Erickson and Dr. Ken Levenstein – Avian Impacts	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
1135	TN # 202483 Ex.1135 - Biological Resources Supplemental Opening Testimony of Andrea Grenier – Avian Mortality Data	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1136	TN # 202484 Ex. 1136 – Bio Supplemental Opening Testimony of Matt Stucky, Chris Morris and Charlie Turlinski – Infeasibility of Curtailment	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1137	TN # 202485 Ex.1137 - Biological Resources Supplemental Opening Testimony of Gustavo Buhacoff – Heliostat Operations at ISEGS and PSEGS	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1138	TN # 202486 Ex.1138 - Table and Graph – GSEP Labor Hours versus Reported Avian Mortality	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1139	TN # 202487 Ex.1139 - Draft Bird and Bat Conservation Strategy	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1140	TN # 202488 Ex.1140 - DeTect Testimony on Deterrent Method	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1141	TN # 202489 Ex.1141 - Biological Resources Supplemental Opening Testimony of Elwood G. Norris – Description of HyperSound Technology	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1142	TN # 202490 Ex.1142 - ISEGS Filed Documents on Pilot Complaints	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/29/2014.
1143	TN # 202491 Ex.1143 - Comparison of Operational Benefits - PSEGS	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	(Tower) versus PV Alternative Subject - Override Considerations	7/30/2014.
	TN # 202494 Ex.1144 - Comparison of Operational Benefits - PSEGS (Tower) versus PSPP (Trough) Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1144		
	TN # 202495 Ex.1145 - CEC 2012 IEPR Update - Important Attributes for California’s Energy Future Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1145		
	TN # 202502 Ex.1146 - Tower Technology Has Greater Potential in the Intermediate-Term Than Trough Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1146		
	TN # 202503 Ex.1147 - Why Not Build TES Now? Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1147		
	TN # 202509 Ex.1148 - Demand for PSEGS with TES Likely to Increase Over Time Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1148		
	TN # 202512 Ex.1149 - CAISO “Duck Curve” Illustrates Potential for PSEGS with Thermal Storage Subject - Override Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1149		
	TN # 202515 Ex.1150 - Infeasibility of Trough and PV Alternatives	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1150		

Exhibit Number	Document Title and Description	Disposition
1151	TN # 202516 Ex.1151 - Alternatives Supplemental Opening Testimony of David Schlosberg – PPA Deadlines	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1152	TN # 202519 Ex.1152 - Project Description Supplemental Opening Testimony - Natural Gas Use	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1153	TN # 202520 Ex.1153 - USFWS Letter to Solar Industry on May 12, 2014	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1154	TN # 202522 Ex.1154 - USFWS February 14, 2014 Memo	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1155	TN # 202524 Ex.1155 - Table Comparing Solar Project Capacity and Acreage	Offered by Applicant (Palen Solar Holdings, LLC); Admitted.
1156	TN # 202525 Ex.1156 - Bird Mortality at Wind Energy Facilities in Southwestern U.S.	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1157	TN # 202506 Ex.1157 - Anthropogenic Sources of Avian Mortality	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1158	TN # 202527 Ex.1158 - Pre-construction Field Survey Efforts Conducted at the PSEGS Project	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1159	TN # 202529 Ex.1159 - Fall Diurnal Raptor Plot	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
1160	TN # 202530 Ex.1160 - Flux Projections at PSEGS	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1161	TN # 202533 Ex. 1161 - Carcass Distribution Plot	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1162	TN # 202534 Ex.1162 - ISEGS Flux Carcass Density Plots	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1163	TN # 202536 Ex.1163 - April 12, 2011 Letter from ABC, National Audubon Society and Others Regarding Feral Cats	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1164	TN # 202537 Ex.1164 - January 28, 2014 Letter from American Bird Conservancy Regarding Feral Cats	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1165	TN # 202504 Ex.1165 - Estimated Bird Cat Predation Rates	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1166	TN # 202727 Ex. 1166 - Project Description Supplemental Rebuttal Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1167	TN # 202726 Ex. 1167 - Revised Phasing Plan	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1168	TN # 202729 Ex. 1168 - Estimated Construction Personnel By Month Phase I	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
1169	TN # 202730 Ex. 1169 - Proposed Modifications to Soil&Water-3	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1170	TN # 202731 Ex.1170 - Proposed Modifications to BIO-29	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1171	TN # 202732 Ex.1171 - Cultural Resources Supplemental Rebuttal Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/29/2014.
1172	TN # 202733 Ex.1172 - Proposed Modifications to CUL-1	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/29/2014.
1173	TN # 202736 Ex.1173 - Biological Resources Supplemental Rebuttal Testimony – Avian Impacts and Mitigation	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1174	TN # 202753 Ex.1174 - ISEGS Winter Quarterly Avian Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1175	TN # 202728 Ex.1175 - ISEGS May TAC Meeting Minutes	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1176	TN # 202741 Ex.1176 - Biological Resources Supplemental Rebuttal Testimony - Insects	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1177	TN # 202735 Ex.1177 - Summary and Analysis of CBD Exhibit 3108	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
1178	TN # 202743 Ex.1178 - Biological Resources Supplemental Rebuttal Testimony – Curtailment Infeasibility, Performance Standards and Polarized	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1179	TN # 202750 Ex.1179 - Alternative Supplemental Rebuttal Testimony	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1180	TN # 202739 Ex.1180 - Traffic and Transportation Supplemental Rebuttal Testimony – Glint and Glare – Effectiveness of Conditions	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/29/2014.
1181	TN # 202744 Ex.1181 - Overriding Considerations Supplemental Rebuttal Testimony – Thermal Energy Storage	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1182	TN # 202754 Ex.1182 - Letter from American Bird Conservancy Grant Sizemore to CEC dated July 10, 2014, Avian Mitigation Plan Clarification	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1183	TN # 202752 Ex.1183 - Article April 23, 2104 DOE’s Moniz Calls For “Urgency” In Climate Change Action	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1184	TN # 202749 Ex.1184 - PBS News Hour Article – World Bank President: Climate Change is Urgent Today Problem	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1185	TN # 202748 Ex.1185 - UN Climate Chief: IPCC Press Release	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1186	TN # 202747 Ex.1186 - Biological Resources Supplemental Rebuttal	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Testimony - DeTect	7/30/2014.
1187	TN # 202746 Ex.1187 - Traffic and Transportation Rebuttal Testimony – Glint and Glare – Pilot Opinion	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1188	TN # 202745 Ex.1188 - HyperSound Technical White Paper	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1189	TN # 202742 Ex.1189 - NREL Report 40 percent RPS	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1190	TN # 202740 Ex.1190 - NREL Report 33 Percent RPS	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1191	TN # 202734 Ex.1191 - Ivanpah SEGS Heliostat Positioning Plan Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1192	TN # 202737 Ex.1192 - Governor Brown Climate Change Article	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1193	TN # 202738 Ex.1193 - White House Climate Change Fact Sheet	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1194	TN # 202799 Example of Typical Uniform Distribution - 1 Exhibit No. 1194	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1195	TN # 202800 Example of Typical Uniform Distribution - 2	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Exhibit No. 1195	7/30/2014.
1196	TN # 202805 ISEGS - Proportion of Area Occupied by Heliostats Exhibit No. 1196	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1197	TN # 202804 ISEGS - Cumulative Proportion of Fatalities by Distance - All Exhibit No. 1197	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1198	TN # 202803 ISEGS - Cumulative Proportion of Fatalities by Distance - Collision Exhibit No. 1198	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1199	TN # 202802 ISEGS - Cumulative Proportion of Fatalities by Distance - Singed Exhibit No. 1199	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1200	TN # 202801 ISEGS - Cumulative Proportion of Fatalities by Distance - Unknown Exhibit No. 1200	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1201	TN # 202810 Ex.1201 - Electromagnetic Radiation Spectrum	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1202	TN # 202809 Ex.1202 - Solar Irradiance Chart	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1203	TN # 202808 Ex.1203 - Summary of ISEGS Bird and Bat Mortality -	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on

Exhibit Number	Document Title and Description	Disposition
	January through June 2014	7/30/2014.
1204	TN # 202811 Ex.1204 - Bird Nesting Map from ISEGS May 2014 Monthly Compliance Report	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1205	TN # 202817 ISEGS and PSEGS Flux-Related Mortality Estimates Comparison Table Exhibit No. 1205	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
1206	TN # 202823 Staff's Comments Regarding a Possible Energy Commission Finding of Overriding Considerations	Offered by Applicant (Palen Solar Holdings, LLC); Admitted on 7/30/2014.
2000	TN # 200442 Palen Solar Electric Generating System FSA - Part A Final Staff Assessment - Part A	Offered by Commission Staff (Staff); Admitted on 10/29/2013.
2001	TN # 200564 Palen Solar Electric Generating System Final Staff Assessment - Part B Final Staff Assessment - Part B	Offered by Commission Staff (Staff); Admitted on 10/28/2013.
2002	TN # 200807 Energy Commission Staff's Testimony and Errata to the Final Staff Assessment Part A Errata to the FSA Part A	Offered by Commission Staff (Staff); Admitted on 10/29/2013.
2003	TN # 200980 Energy Commission Staff's Rebuttal Testimony with Attachments	Offered by Commission Staff (Staff); Admitted on 10/29/2013.
2004	TN # 200847 Ethnographic Report Informing the Final Staff Assessment	Offered by Commission Staff (Staff); Admitted on 10/28/2013.

Exhibit Number	Document Title and Description	Disposition
2005	TN # 200995 Exhibit 2005 - CDFW Outline for Proposed Desert Kit Fox Health Monitoring and Mitigation Program to CEC	Offered by Commission Staff (Staff); Admitted on 10/28/2013.
2006	TN # 200951 Preliminary Determination of Compliance / Title V / Notice of Intent to Issue Permit PDOC/Title V/Public Notice	Offered by Commission Staff (Staff); Admitted on 10/29/2013.
2007	TN # 200902 Energy Commission Staff's Testimony and Errata to the Final Staff Assessment Part B Errata Part B	Offered by Commission Staff (Staff); Admitted on 10/28/2013.
2008	TN # 201006 Final Staff Assessment - Supplement A	Offered by Commission Staff (Staff); Admitted on 10/29/2013.
2010	TN # 201030 Lorey Cachora Declaration, Bio and CV	Offered by Commission Staff (Christine Stora); Admitted on 10/28/2013.
2011	TN # 201088 Exhibit 2011 – Conditions of Certification PAL-5 and PAL-9	Offered by Commission Staff (Staff); Admitted on 11/22/2013.
2012	TN # 201089 Exhibit 2012 – Condition of Certification Worker Safety-5	Offered by Commission Staff (Staff); Admitted on 11/22/2013.
2013	TN # 201097 Palen - Final Staff Assessment Part C Final Staff Assessment - Part C	Offered by Commission Staff (Staff); Admitted on 11/22/2013.
2015	TN # 201322 SCAQMD's Comments to the Final Staff Assessment for Palen Solar Generation FSA comments from SCAQMD	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.

Exhibit Number	Document Title and Description	Disposition
2016	TN # 201373 Final Determination of Compliance	Offered by Commission Staff (Staff); Admitted on 12/5/2013.
2017	TN # 202480 Energy Commission Staff Supplemental Staff Assessment and Testimony	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2018	TN # 202773 Staff's Rebuttal Testimony (Supersedes by TN 202757)	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2019	TN # 202210 CEC Staff's Response to Petitioner's Motion to Reopen Evidentiary Record	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2020	TN # 202766 CUL-1 including Cover letter Clean version of CUL-1	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2023	TN # 202700 Palen Solar Generating System Glare Video	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2024	TN # 202583 Email Re: Ivanpah Solar Power Plant Site Recon, dated May 9, 2014	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2025	TN # 202584 Email with attached Palen Aeronautical Study, dated June 9, 2014	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2026	TN # 202585 Email Re: Request for Ivanpah Report, dated June 10, 2014	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2027	TN # 202708 Determination of No Hazard to Air Navagation, dated	Offered by Commission Staff (Jennifer Martin-Gallardo);

Exhibit Number	Document Title and Description	Disposition
	07/18/2013 Solar Tower Unit 1	Admitted on 7/29/2014.
2028	TN # 202709 Determination of No Hazard to Air Navigation, dated 07/18/2013 Solar Tower Unit 2	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2029	TN # 202793 Mark Hesters Resume	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2030	TN # 202794 Dave Vidaver Resume	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2031	TN # 202795 Brett Fooks Resume	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
2033	TN # 202814 Glare Evaluation of Ivanpah Solar Electric Generating System email	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/29/2014.
2034	TN # 202816 Revised BIO-29 Table 3	Offered by Commission Staff (Jennifer Martin-Gallardo); Admitted on 7/30/2014.
3000	TN # 200905 Exhibit 3000: Center Opening Testimony and Exhibit List Intervenor's Opening Testimony	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3001	TN # 200853 Exh. 3001-Anderson Testimony, Declaration & CV Anderson Testimony, Declaration & CV	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
3002	TN # 200854 Exh. 3002-Journal Article re Wildlife Conservation	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/29/2013.
3003	TN # 200858 Exh. 3003-Journal Article-How much compensation is enough	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3004	TN # 200857 Exh. 3004-Journal Article-Biodiversity offsets	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3005	TN # 200856 Exh. 3005-Preparing for any Action that may occur within the Range of the Mojave Desert Tortoise USFWS guidance on tortoise surveys	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3006	TN # 200855 Exh. 3006-2007 Annual Report re Range-Wide Monitoring of the Mojave Population of the Desert Tortoise USFWS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3007	TN # 200861 Exh. 3007-2012 DRAFT Rangewide Mojave Desert Tortoise Monitoring USFWS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3008	TN # 200860 Exh. 3008-The Health Status of Translocated Desert Tortoises 2009 Report USGS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3009	TN # 200859 Exh. 3009-Recommendations of Independent Science Advisors for the California DRECP	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
	Technical report	
3010	TN # 200864 Exh. 3010-ISEGS DT near or on Stateline project site. Map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3011	TN # 200929 Exh. 3011. Esque etal. 2010 Effects of subsidized predators & translocation journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3012	TN # 200862 Exh. 3012-BLM 2012 Solar Apps and Auths BLM list	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3013	TN # 200867 Exh. 3013-BLM Wind Apps & Auths July 2012 BLM list	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3014	TN # 200866 Exh. 3014-Kern County wind projects Kern County list	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3015	TN # 200865 Exh. 3015-McCoy Solar Energy Project PA-FEIS Vol. 1 BLM FEIS	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3016	TN # 200868 Exh. 3016-Desert Kit Fox Distemper outbreak Los Angeles times article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3017	TN # 200869 Exh. 3017-5-Year Review Yuma clapper rail USFWS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3018	TN # 200871 Exh. 3018-Yuma clapper rail recovery plan	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	USFWS document	10/29/2013.
3019	TN # 200870 Exh. 3019-EBird Lake Tamarisk hotspot checklist 10-15-13 checklist	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3020	TN # 200874 Exh. 3020-Journal Article-Golden Eagle Population Trends in the Western United States: 1968–2010	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3021	TN # 200873 Exh. 3021-Golden Eagles in US-Canada - status trends journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3022	TN # 200872 Exh. 3022-FINAL Report_Joshua Tree National Park_GE Survey 2011 NPS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3023	TN # 200876 Exh. 3023-Appendix C.7 Desert Harvest DEIS Golden Eagle Winter Survey Report BLM DEIS appendix	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3024	TN # 200875 Exh. 3024-Southern California Edison Notice to Proceed Request for the Red Bluff Substation Project Distribution Line SCE request for notice to proceed	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3025	TN # 200878 Exh. 3025-Bald Eagle and Golden Eagle Mortalities at Wind Energy Facilities in the Contiguous United States	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3026	TN # 200877 Exh. 3026-Avian Mortality at Solar Energy Plant.	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	journal article	10/29/2013.
3027	TN # 200931 Exh. 3027. Manning 2009. BUOW Pop Size in Imp Valley CA Report to IID	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3028	TN # 200880 Exh. 3028-Staff Report on Burrowing Owl Mitigation CDFG staff report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3029	TN # 200879 Exh. 3029-USFWS 2003 Burrowing Owl FWS Status-Assessment USFWS report	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3030	TN # 200883 Exh. 3030-Modern Insect Extinctions journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3031	TN # 200882 Exh. 3031- Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Casey's June Beetle and Des	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3032	TN # 200885 Exh. 3032-Wildlife Interactions at Solar 1 Facility. Report to SCE	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3033	TN # 200884 Exh 3033-Potential Roles of Biological Soil Crusts journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3034	TN # 200886 Exh. 3034-Biological Soil Crusts and Wind Erosion journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
3035	TN # 200887 Exh. 3035-Disturbance and Recovery of Biological Soil Crusts journal article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3036	TN # 200930 Exh. 3036. Impact Minimization Alternative (MFTL&RP) Map of alternative	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3037	TN # 200892 Exh. 3037-Pat Flanagan testimony, declaration & resume.	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3038	TN # 200891 Exh. 3038-Birds Banded at the Salton Sea map of birds	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3039	TN # 200890 Exh 3039-Priority Areas for Breeding Birds within the Planning Area of DRECP	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3040	TN # 200900 Exh. 3040-A Linkage Network For The California Deserts BLM cocument	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3041	TN # 200889 Exh. 3041-Journal Article-Use of Land Facets to Plan for Climate Change:Conserving the Arenas, Not the Actors	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3042	TN # 200888 Exh. 3042-Journal Article-Use of land facets to design linkages for climate change	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3043	TN # 200897 Exh. 3043-Mojave National Preserve-Stepladder Turtle Mountains Land Facets	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
	map	
3044	TN # 200896 Exh. 3044-Stepladder Turtle Mountains-Palen McCoy Land Facets map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3045	TN # 200895 Exh. 3045-Palen-McCoy-Whipple Mountain Land Facets map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3046	TN # 200894 Exh. 3046-Joshua Tree National Park - Palen McCoy Mountains Land Facets map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3047	TN # 200893 Exh. 3047-Palen-McCoy-Chocolate Mtns LF map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3048	TN # 200899 Exh. 3048-Desert Tortoise LCU map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3049	TN # 200898 Exh. 3049-Land Facets Ca Deserts Map map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3050	TN # 200904 Exh 3050 Testimony of Allan Muth Expert testimony	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3051	TN # 200910 Exhibit 3051: California's Famous "duck chart" is outdated, experts say news article	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
3052	TN # 200467 Email from Jaime Rudd re Palen Updated Map	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3053	TN # 200466 Kit Fox Den Activity Map - September 2013	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3054	TN # 200531 Due Diligence Request for Information to Palen Solar Holdings from US Department of the Interior, Bureau of Land Management	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3055	TN # 200106 USFWS email to Pete Bloom in re: Palen Helo GOEA Nest Survey Flights email	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3056	TN # 71593 Record of Conversation - REAT Number 10 Record of Conversation - REAT Number 10	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3057	TN # 200962 Exh. 3057 Avian Mortality Report 9-1-2013 (ISEGS) spreadsheet of avian mortalities from ISEGS	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3058	TN # 200966 Exh. 3058a. HHSEGS FSA Part 1 CEC's HHSEGS FSA	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3059	TN # 200961 Exh. 3059. Monthly Compliance Report August 2013 (Genesis) monthly compliance report on Genesis from August 2013	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
3060	TN # 200963 Exh. 3060 . ISEGS September 2013 Monthly Compliance Report Monthly compliance report Sept. 2013 ISEGS	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3061	TN # 200964 Exh 3061 Muth Rebuttal Testimony rebuttal testimony	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3062	TN # 200065 CBD's Comments on PSA Final - Attachment 9 Helix 2013. DPV2 MFTL Monitoring Summary 071113	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3063	TN # 200965 Exh. 3058b. HHSEGS FSA Part 2 CEC's HHSEGS FSA	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3064	TN # 201075 Exh 3064 Chain Link Sand Fence photo photo	Offered by Intervenor (Center for Biological Diversity); Admitted on 10/29/2013.
3065	TN # 201102 Exhibit 3065 Record Identification Record Identification for oral testimony on fence line	Offered by Intervenor (Center for Biological Diversity); Admitted.
3066	TN # 201261 Exhibit 3066. NPS comments on PSEGS SDEIS NPS comment on PSEGS SDEIS	Offered by Intervenor (Center for Biological Diversity); Admitted.
3067	TN # 201284 Exh. 3067 Air Quality Testimony I. Anderson PSEGS Air Quality testimony and additional Biology	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3068	TN # 201279 Exh. 3068. Desert Sunlight Air Quality Monitoring Report March 2012	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	AQ MONITORING REPORT	11/22/2013.
	TN # 201283	
3069	Exh. 3069 Desert Sunlight Air Quality Monitoring Report April 2012 AQ MONITORING REPORT	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201282	
3070	Exh. 3070 Desert Sunlight Air Quality Monitoring Report May 2012 AQ MONITORING REPORT	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201281	
3071	Exh. 3071 Desert Sunlight Air Quality Monitoring Report June 2012 AQ MONITORING REPORT	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201280	
3072	Exh.3072 Desert Sunlight Air Quality Monitoring Report July 2012 AQ MONITORING REPORT	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201286	
3073	Exh. 3073 Desert Sunlight Air Quality Monitoring Report August 2012 AQ Monitoring Report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201285	
3074	Exh. 3074 Desert Sunlight Air Quality Monitoring Report Sept. 2012 AQ Monitoring Report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
	TN # 201289	
3075	Exh. 3075 Desert Sunlight Air Quality Monitoring Report Oct. 2012 AQ Monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.

Exhibit Number	Document Title and Description	Disposition
3076	TN # 201288 Exh 3076 Desert Sunlight Air Quality Monitoring Report Nov. 2012 AQ Monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3077	TN # 201287 Exh. 3077 Desert Sunlight Air Quality Monitoring Report Dec. 2012 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3078	TN # 201290 Exh. 3078 Desert Sunlight Air Quality Monitoring Report Jan 2013 AQ Monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3079	TN # 201292 Exh. 3079 Desert Sunlight Air Quality Monitoring Report Feb 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3080	TN # 201291 Exh. 3080 Desert Sunlight Air Quality Monitoring Report March 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3081	TN # 201293 Exh. 3081 Desert Sunlight Air Quality Monitoring Report April 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3082	TN # 201296 Exh. 3082 Desert Sunlight Air Quality Monitoring Report May 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3083	TN # 201295 Exh. 3083 Desert Sunlight Air Quality Monitoring Report	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	June 2013 AQ monitoring report	11/22/2013.
3084	TN # 201294 Exh. 3084 Desert Sunlight Air Quality Monitoring Report July 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3085	TN # 201297 Exh. 3085 Desert Sunlight Air Quality Monitoring Report August 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3086	TN # 201300 Exh. 3086 Desert Sunlight Air Quality Monitoring Report Sept. 2013 AQ monitoring report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3087	TN # 201299 Exh. 3087 Solar threatens biofuels Article	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3088	TN # 201298 Exh. 3088 Funnel Effect Discussion Article	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3089	TN # 201302 Exh. 3089 Ivanpah Solar Electric Generating System Oct 2013 Monthly Compliance Report monitoring compliance report	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3090	TN # 201301 Exh. 3090 Ivanpah Solar Plants May be Attracting Birds article	Offered by Intervenor (Center for Biological Diversity); Admitted on 11/22/2013.
3091	TN # 201307	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Palen Solar Project Site and Private Parcels Map	7/30/2014.
3092	TN # 202500 Exh. 3092 Opening Testimony for Reopened Hearings and Updated Exhibit List	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3093	TN # 202492 Exh. 3093. Pratt Testimony, Declaration & CV	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3094	TN # 202493 Exh. 3094. Ballmer 1995 Ballmer 1995	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3095	TN # 202498 Exh. 3095. Table 1. Plants & butterfly larval food plants on Palen	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3096	TN # 202497 Exh. 3096 - Pygmy Blue butterfly Photo of Pygmy Blue Butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3097	TN # 202496 Exh. 3097 Gray hairstreak butterfly Photo of gray hairstreak butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3098	TN # 202510 Exh. 3098 - Palmer's metalmark butterfly photo of Palmer's metalmark butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3099	TN # 202508 Exh. 3099 - Monarch butterfly Photo of Monarch butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3100	TN # 202507 Exh. 3100 - Queen Butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Photo of Queen butterfly	7/30/2014.
3101	TN # 202505 Exh. 3101 - Buckeye butterfly Photo of buckeye butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3102	TN # 202514 Exh. 3102 - Painted lady butterfly photo of painted lady butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3103	TN # 202513 Exh. 3103 checkered white butterfly Photo of checkered white butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3104	TN # 202511 Exh. 3104 - Funeral duskywing butterfly Photo of funeral duskywing butterfly	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3105	TN # 202532 Exh. 3105 Pratt 1998 EAFB surveys 1996	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3106	TN # 202531 Exh. 3106 Pratt 2000 EAFB study 1996-1998	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3107	TN # 202538 Exh. 3107 Kagan et al 2014 Avian mortality Report	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3108	TN # 202539 Exh. 3108 - Andrews et al. 1979 Coleopterus fauna CA desert sand dunes	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3109	TN # 202540 Exh. 3109. Tinkham 1975	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Neararctic desert sand dune Orthoptera	7/30/2014.
3110	TN # 202541 Exh. 3110 Spaniacris & Xeracris Photo of Spaniacris deserticola and Xeracris snowii	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3111	TN # 202542 Exh. 3111 Strohecker et al. 1968 Grasshopper key	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3112	TN # 202543 Exh. 3112. Philotiella speciosa Photo of Philotiella speciosa	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3113	TN # 202544 Exh. 3113. Powers Testimony, Decl. & CV Bill Powers Testimony, Declaration & CB	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3114	TN # 202545 Exh. 3114. CA solar initiative CA's solar initiative (CPUC)	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3115	TN # 202546 Exh. 3115 AB 327 AB 327 - CA RPS program expanding net metering	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3116	TN # 202547 Exh. 3116 CPUC Decision 11-01-025 CPUC Decision 11-01-025. Rulemaking on RPS	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3117	TN # 202548 Exh. 3117 CAISO Peak Load History CAISO Peak Load History 1998-2013	Offered by Intervenor (Center for Biological Diversity); Admitted.
3118	TN # 202549 Exh. 3118. CA Energy Storage Mandate	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	CA Energy Storage Mandate	7/30/2014.
3119	TN # 202550 Exh. 3119. CPUC Energy Storage Decision CPUC Energy Storage Decision D1310040 - 17Oct13	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3120	TN # 202551 Exh. 3120 CPUC PR Track 4 LTPP CPUC PR Track 4 LTPP final decision	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3121	TN # 202552 Exh. 3121 ICF Jones & Stokes ICF Jones & Stokes OTC reliability study	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3122	TN # 202553 Exh. 3122 EPW PNM to build 4 solar projects next year EPW - PNM to build 4 solar projects next year	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3123	TN # 202554 Exh. 3123 EPW - Large scale solar prices plummet EPW - Large scale solar prices plummet in West	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3124	TN # 202555 Exh. 3124. GTM - Ivanpah gets approval GTM - Ivanpah gets approval \$5.50 watt	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3125	TN # 202556 Exh. 3125. NGEJ . Feds bet on wrong solar NGEJ. Federal gov't bets on wrong solar horse	Offered by Intervenor (Center for Biological Diversity); Admitted.
3126	TN # 202557 Exh. 3126. Anderson testimony Ileene Anderson testimony on PSEGS reopening of evidentiary record	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3127	TN # 202558 Exh. 3127. Flanagan 2014	Offered by Intervenor (Center for Biological Diversity); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Flanagan, P. 2014. Impact on Migratory birds	7/30/2014.
3128	TN # 202499 Exh. 3128 Testimony of Smallwood and CV	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3129	TN # 202501 Exh. 3129 Article Map Based Repowering and Reorganization of a Wind Resource Area to Minimize Burrowing Owl and Other Bird Fatal Smallwood et al 2009b	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3130	TN # 202521 Exh. 3130 Smallwood - Suggested Standards for Science Applied to Conservation Issues	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3131	TN # 202518 Exh. 3131 Smallwood Article - Estimating Wind Turbine– Caused Bird Mortality	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3132	TN # 202517 Exh. 3132 Smallwood Article Comparing Bird and Bat Fatality-Rate Estimates Among North American Wind-Energy Projects	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3133	TN # 202528 Exh. 3133 Horvitz and Thompson 1952	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3134	TN # 202526 Exh. 3134 Smallwood Article - Response to Huso and Erickson’s Comments on Novel Scavenger Removal Trials	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3135	TN # 202523 Exh. 3135 Smallwood Article - Influence of Behavior on Bird Mortality in Wind Energy Developments	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
3136	TN # 202559 Exh. 3136 Smallwood 2009	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3137	TN # 202560 Exh. 3137 Smallwood & Karas 2009 Avian and Bat Fatality Rates at Old-Generation and Repowered Wind Turbines in California	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3138	TN # 202561 Exh. 3138 Smallwood 2008 ARTICLE - WIND POWER COMPANY COMPLIANCE WITH MITIGATION PLANS IN THE ALTAMONT PASS WIND RESOURCE AREA	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3139	TN # 202562 Exh. 3139 Smallwood et al 2010 Novel Scavenger Removal Trials Increase Wind turbine - Caused Avian Fatality Estimates	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3140	TN # 202698 Exh 3140 Corrections to Opening Testimony Smallwood Opening Testimony; Corrections	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3141	TN # 202765 Exh 3141 Center Rebuttal Intro	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3142	TN # 202762 Ex. 3142 Rebuttal Testimony of Gordon Pratt PhD	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3143	TN # 202761 Ex. 3143 Photo	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.

Exhibit Number	Document Title and Description	Disposition
3144	TN # 202764 Exh 3144 Smallwood Rebuttal Testimony	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3145	TN # 202763 Exh 3145 Van Vuren and Smallwood 1996	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3146	TN # 202768 Exh 3146 Powers Rebuttal Testimony	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3147	TN # 202769 Exh 3147 PV Magazine Tenaska Switches	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3148	TN # 202770 Exh 3148 GreenTech Media; California Closes in on Smart Solar Inverter Rules	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3149	TN # 202767 Exh 3149 GreenTech Media: Western Utilities Call for Smart Solar Inverters	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3150	TN # 202780 Center Prehearing Conf. Statement and updated exhibit list	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
3151	TN # 202786 Response to Request for Clarification Regarding Solar Flux-Related Avian Mortalities From United States Department of the Interior, Fish and Wildlife Service	Offered by Intervenor (Center for Biological Diversity); Admitted on 7/30/2014.
4000	TN # 200991 Exhibit 4000-Impacts to Visual Resources from the Palen	Offered by Intervenor (Basin and Range Watch); Admitted on

Exhibit Number	Document Title and Description	Disposition
	Solar Energy Power Project	10/28/2013.
4001	TN # 202579 Basin and Range Watch Exhibit 4001	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4002	TN # 202575 Basin and Range Watch Exhibit 4002	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4003	TN # 202576 Basin and Range Watch Exhibit 4003	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4004	TN # 202577 Basin and Range Watch Exhibit 4004	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4005	TN # 202573 Basin and Range Watch Exhibit 4005	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4006	TN # 202574 Basin and Range Watch 4006	Offered by Intervenor (Basin and Range Watch); Admitted on 7/29/2014.
4007	TN # 202760 Ex 4007, May 2014 TAC report for Ivanpah	Offered by Intervenor (Basin and Range Watch); IDENTIFIED.
4008	TN # 202759 Ex. 4008, 4 Reasons Why it's a Bad Argument to Say Cats Kill More Birds Than Wind Turbines	Offered by Intervenor (Basin and Range Watch); IDENTIFIED.
5000	TN # 200226 Alfred Figueroa email providing Factual Info by La Cuna Aztlan Sacred Sites Protection Circle ISO Opposition to	Offered by Intervenor (Alfredo Acosta Figueroa); Admitted on 10/29/2013.

Exhibit Number	Document Title and Description	Disposition
	Project	
5001	TN # 201085 Exhibit 5001 (back) Photo of Corn Springs Offramp	Offered by Intervenor (Alfredo Figueroa - CaRE); Admitted on 10/29/2013.
5002	TN # 201086 Ex. 5002 - Clipping of a photograph of sculpture of Native American idol	Offered by Intervenor (Alfredo Figueroa - CaRE); Admitted on 10/29/2013.
6000	TN # 202571 Exh 6000 Testimony of William J. Perez on Behalf of CURE on Overriding Considerations	Offered by Intervenor (CURE); Admitted on 7/30/2014.
8000	TN # 200912 Intervenor CRIT Ex. 8000	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8001	TN # 200911 Intervenor CRIT Ex. 8001	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8002	TN # 200915 Intervenor CRIT Ex. 8002	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8003	TN # 200914 Intervenor CRIT Ex. 8003	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8004	TN # 200913 Intervenor CRIT Ex. 8004	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8005	TN # 200916 Intervenor CRIT Ex. 8005	Offered by Intervenor (Colorado River Indian Tribes); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/28/2013.
8006	TN # 200918 Intervenor CRIT Ex. 8006	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8007	TN # 200917 Intervenor CRIT Ex. 8007	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8008	TN # 200921 Intervenor CRIT Ex. 8008	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8009	TN # 200920 Intervenor CRIT Ex. 8009	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8010	TN # 200919 Intervenor CRIT Ex. 8010	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8011	TN # 200923 Intervenor CRIT Ex. 8011	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8012	TN # 200922 Intervenor CRIT Ex. 8012	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8013	TN # 200925 Intervenor CRIT Ex. 8013	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8014	TN # 200924 Intervenor CRIT Ex. 8014	Offered by Intervenor (Colorado River Indian Tribes); Admitted on

Exhibit Number	Document Title and Description	Disposition
		10/28/2013.
8019	TN # 200926 Intervenor CRIT Ex. 8019	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8020	TN # 200998 Intervenor CRIT Exh. 8020	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8021	TN # 200927 Opening Testimony, Exhibit List, and Exhibits	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8022	TN # 200908 Testimony of W. Patch re Impacts of Renewable Energy Projects on CRIT	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8023	TN # 200906 Opening Testimony of R. Loudbear, et al re Comments on Cultural Resources, Visual Resources, Enviro Justice, Bio Resource, Alts	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8024	TN # 200909 Opening Testimony of R. Loudbear, et al re Lessons Learned from the Unanticipated Discovery at Genesis CRIT	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/29/2013.
8025	TN # 200907 Testimony of D. Bonamici re Consultation and Ethnographic Study for Palen Project	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8026	TN # 201047 Testimony of Wilene Fisher-Holt and email from CRIT Counsel re Confidentiality Process	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.

Exhibit Number	Document Title and Description	Disposition
8027	TN # 200979 Rebuttal Testimony of R. Loudbear, W. King, S. Clark re Cultural Resources	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 10/28/2013.
8028	TN # 202563 Exhibit 8028 Testimony of Chairman Dennis Patch	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8029	TN # 202564 Exhibit 8029 Summary Transcript of 4-8-14 Workshop	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8030	TN # 202565 Exhibit 8030 Testimony of Councilwoman Amanda Barrera	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8031	TN # 202566 Exhibit 8031 Testimony of Ted Swendra	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8032	TN # 202567 Exhibit 8032 FAA World Aeronautical Chart Section CG-18	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8033	TN # 202568 Exhibit 8033 The Ivanpah ASRS Report	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8034	TN # 202569 Exhibit 8034 Glare Factor Solar Installations and Airports	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.
8035	TN # 202570 Exhibit 8035 Testimony of David Harper	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/30/2014.

Exhibit	Document Title and Description	Disposition
8036	TN # 202755 CRIT Intervnor Ex. 8036-Rebuttal Testimony of Councilwoman Amanda Barrera	Offered by Intervenor (Colorado River Indian Tribes); Admitted on 7/29/2014.

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State of California, Edmund G. Brown Jr., Governor

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## APPENDIX C

# Proof of Service List

Docket: 09-AFC-07C

Project Title: Palen Solar Power Project - Compliance

Generated On: 9/4/2014 9:26:13 AM

## Applicant

### **Charlie Turlinski**

Palen Solar Holdings, LLC  
1999 Harrison Street, Suite 2150  
Oakland, CA 94612  
cturlinski@brightsourceenergy.com

### **Clay Jensen**

Palen Solar Holdings, LLC  
1999 Harrison Street, Suite 2150  
Oakland, CA 94612  
cjensen@brightsourceenergy.com

### **Matthew Stucky**

Palen Solar Holdings, Inc.  
1 Kaiser Plaza, Suite 1675  
Oakland, CA 94612  
matt.stucky@solar.abengoa.com

### **Sobia Naqvi**

Palen Solar Holdings, LLC  
4505 E. Chandler Blvd., Suite 120  
Phoenix, AZ 85048  
Sobia.Naqvi@solar.abengoa.com

## Applicant Representative

### **Marie Fleming**

Galati/Blek, LLP  
455 Capitol Mall, Suite 315  
Sacramento, CA 95814  
mfleming@gb-llp.com

### **Scott Galati**

Galati/Blek, LLP  
455 Capitol Mall, Suite 315  
Sacramento, CA 95814  
sgalati@gb-llp.com

## Applicant Consultant

### **Andrea Grenier**

Centerline  
1420 E. Roseville Parkway, Suite 140-  
377  
Roseville, CA 95661  
andrea@agrenier.com

## Intervenor

**Alfredo Acosta Figueroa**  
Californians for Renewable Energy  
424 North Carlton Avenue  
Blythe, CA 92225  
lacunadeaztlan@aol.com

**Christina M. Caro**, Counsel for  
Hildeberto Sanchez, Eddie  
Simmons, and LIUNA  
Lozeau|Drury LLP  
410 12th Street, Suite 250  
Oakland, CA 94607  
christina@lozeaudrury.com

**Elizabeth Klebaner**, Counsel for  
California Unions for Reliable  
Energy (CURE)  
Adams Broadwell Joseph &  
Cardozo  
601 Gateway Boulevard, Suite  
1000  
South San Francisco, CA 94080  
eklebaner@adamsbroadwell.com

**Ileene Anderson**, Public Lands Desert  
Director  
Center for Biological Diversity  
PMB 447, 8033 Sunset Boulevard  
Los Angeles, CA 90046  
ianderson@biologicaldiversity.org

**Kevin Emmerich**  
Basin and Range Watch  
P.O. Box 153  
Baker, CA 92309  
atomictoadranch@netzero.net

**Laura Cunningham**  
Basin and Range Watch  
P.O. Box 153  
Baker, CA 92309  
bluerockiguana@hughes.net

**Rebecca Loudbear**, Office of the  
Attorney General  
Colorado River Indian Tribes  
26600 Mohave Road  
Parker, AZ 85344  
rloudbear@critoj.com

**Richard T. Drury**, Counsel for  
Hildeberto Sanchez, Eddie  
Simmons, and LIUNA  
Lozeau|Drury LLP  
410 12th Street, Suite 250  
Oakland, CA 94607  
richard@lozeaudrury.com

**Tanya A. Gulesserian**, Counsel for  
California Unions for Reliable  
Energy (CURE)  
Adams Broadwell Joseph &  
Cardozo  
601 Gateway Boulevard, Suite  
1000  
South San Francisco, CA 94080  
tgulesserian@adamsbroadwell.com

## Intervenor Representative

**Lisa T. Belenky**, Attorney  
Center for Biological Diversity  
351 California Street, Suite 600  
San Francisco, CA 94104  
lbelenky@biologicaldiversity.org

**Sara A. Clark**, Counsel for  
Colorado River Indian Tribes  
Shute, Mihaly & Weinberger, LLP  
396 Hayes Street  
San Francisco, CA 94102  
clark@smwlaw.com

**Winter King**, Counsel for Colorado  
River Indian Tribes  
Shute, Mihaly & Weinberger, LLP  
396 Hayes Street  
San Francisco, CA 94102  
king@smwlaw.com

## Commission Staff

**Christine Stora**, Project Manager  
California Energy Commission  
Siting, Transmission & Environmental  
Protection Division, 1516 Ninth Street,  
MS-2000  
Sacramento, CA 95814  
christine.stora@energy.ca.gov

**efiling archive**  
California Energy Commission  
Sacramento, CA  
efilingPOSarchive@energy.ca.gov

**Jennifer Martin-Gallardo**, Staff  
Counsel  
California Energy Commission  
Office of the Chief Counsel, 1516  
Ninth Street, MS-14  
Sacramento, CA 95814  
jennifer.martin-  
gallardo@energy.ca.gov

## Committee

**DAVID HOCHSCHILD, Associate**

**Member**, Commissioner  
California Energy Commission  
Sacramento, CA

**Emilio Camacho**, Adviser to  
Commissioner Hochschild  
California Energy Commission  
CA

**KAREN DOUGLAS, Presiding Member**,  
Commissioner  
California Energy Commission  
Sacramento, CA

**Eileen Allen**, Commissioners'  
Technical Adviser for Facility Siting  
California Energy Commission  
Sacramento, CA

**Gabriel Taylor**, Adviser to  
Commissioner Hochschild  
California Energy Commission  
Sacramento, CA

**Ken Celli**, Hearing Adviser  
California Energy Commission  
Sacramento, CA

**Eli Harland**, Adviser to  
Commissioner Douglas  
California Energy Commission  
Sacramento, CA

**Jennifer Nelson**, Adviser to  
Commissioner Douglas  
California Energy Commission  
Sacramento, CA

## Public Adviser

**Alana Mathews**, Public Adviser  
California Energy Commission  
Public Advisers Office, 1516 Ninth Street,  
MS-12  
Sacramento, CA 95814  
publicadviser@energy.ca.gov

## Public Agency

**California ISO**  
Folsom, CA  
e-recipient@caiso.com

**Mohsen Nazemi**, Deputy  
Executive Officer  
South Coast Air Quality  
Management District  
21865 Copley Drive  
Diamond Bar, CA 91765  
mnazemi1@aqmd.gov

**Tiffany North**, Supervising Deputy  
County Counsel  
Riverside County  
3960 Orange Street, Suite 500  
Riverside, CA 92501  
tnorth@co.riverside.ca.us